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## Contributions.

## Reverse or Not?

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of Dec. 31 a correspondent calls attention to conflicting instructions given to engineers about reversing the locomotive when driver brakes are applied, and the directions given in my book "Locomotive Engine Running and Management" are quoted. That part of the book was written when I was running a locomotive and the directions were based upon what I found to be the best practice. The driver brakes in use were much less efficient than they are to-day, and wheel sliding seldom began until the train was almost stopped. The resisting force of the reversed engine was greater than the stopping power exerted by the driver brakes, and it was my practice to watch till the wheels were beginning to slide, then I opened the cylinder cocks (which usually relieved the tendency to slide) or released the brake.

With the efficient driver brakes now in use, I would say "do not reverse the engine when the driver brake is applied."

ANGUS SINCLAIR.

## Concerning the Pittsburgh Testing Laboratory.

Pittsburgh Testing Laboratory, Limited,  
CHICAGO, Dec. 31, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A certain false and malicious rumor intended to injure us have been circulated regarding the efficiency and integrity of the services rendered by us as inspectors of 35,000 tons of cast iron pipe, being made by the Addyston Pipe & Steel Co. for the city of Chicago, and wide publicity has been given to the statement that six pieces of 36-in. pipe have been rejected after delivery. We requested the Commissioner of Public Works and the City Engineer of Chicago to thoroughly investigate the matter. After such investigation the City Engineer, Mr. John Ericson, has reported to the Commissioner of Public Works, Mr. L. E. McGann, that the Pittsburgh Testing Laboratory, Limited, have performed their duties in a satisfactory manner, and further that there is no cause for the rejection of any pipe previously accepted by their inspectors, except those broken in transit and handling.

We make this statement desiring to correct any false impressions which may have been created by these reports.

T. L. CONDRON, Resident Engineer.

## Calling a Spade an Agricultural Implement.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the description of the electric freight locomotive in your last issue references are made to the "engineer's tool box"; does that mean that the future motorman, like the present locomotive driver, is to be misnamed an engineer? All the efforts on the part of railroad managers and others in this country to prevent engineers from filching a title which does not belong them have been unsuccessful so far. The "locomotive engineer" has come to stay—as long as the steam locomotive does. But there is a chance to correct the misnomer before he takes possession of the electric motor for good. Cable-car men have been "gripmen" and trolley men "motormen" without loss of credit, but the moment the motor appears on a "steam" road you begin to style its operator the "engineer."

And, by the way, you call the motor a "locomotive," which is just about as incorrect; but you do that because you had already misapplied the term "motor" and confined it to the rotative part of itself only.

What is greatly needed is a compact word that will

express correctly what you have in what may be termed your "railroad mind," namely, a single derived power machine capable of moving a train of cars as a locomotive does, and as distinguished from another variety of the same machine which is intended for self-propulsion only. Neither of these machines would be a locomotive unless the electric current were to be generated within it, which might be done. The electrical engineers speak of single units and double units and multiple units, or what not, which are definitions that do not define, and are clumsy. What you really want is a simple term that cannot be misunderstood, like "electric puller," for instance; "puller," for short.

These are small matters, many will say, but when we think of the millions and millions of repetitions, and the unnecessary explanations that would be saved by deporting these inaccuracies, they grow in importance.

A. STICKLER.

## The Gas Engine and its Mission.—III.

BY S. A. REEVE.\*

(Continued from page 21.)

In the line of power for standard factory service the incursion of gas engines into large powers is quite considerable. The largest engine ever reported is a 600-H. P. compound in an English textile mill. This engine had three single-acting cylinders, two regular Otto engines on either side, and a larger low-pressure cylinder in the center into which the Otto engines exhausted after each explosion-stroke alternately. The Otto cranks were in unison and set opposite to the low-pressure crank, thus providing one impulse each stroke. It was started by steam pressure in one Otto cylinder. A photograph of this engine will be found in *Progressive Age* for Feb. 15, 1895. I believe that tests gave the fuel rate of this engine as the disappointing figure of 1.25 lbs. of coal per I. H. P. hour, and as Clerk does not mention it in his last edition its fate is uncertain.

This authority gives the palm for size to a 400 H. P. Andrews engine built at Stockport and operating at Godalming (England). It comprises two Otto single-acting cylinders set tandem, the power from the rear one being carried around the other by parallel rods from crosshead to crosshead. Both of these engines are operated upon Dowson gas.

The next in line is probably a 320 H. P. Simplex single-cylinder Otto engine operating a large flour mill in the suburbs of Paris by means of gas from a Buire. Lencauchez producer; and from this size down Europe offers a number of illustrations, although Germany, the home of the gas engine, seems to have done little in the way of large engines.

In this country examples of large engines are an "American" engine of 100 H. P., operating an electric street railroad at Lancaster, O.; a 100 H. P. Crossley-Otto, operating a wire mill at Worcester, Mass., upon special generator gas; the electric light station at Danbury, Conn. (reported to the American Society of Mechanical Engineers at its April meeting in 1895); an electric station at Woonsocket, R. I., and a 150-H. P. engine has been running at the works of the Westinghouse Machine Co., the past year, and a 250 H. P. engine has been in successful operation for two years at Pittsburgh, Pa. In none of these cases can any broad observations be made as to the success of the installation. In general terms they all seem to be satisfactory and economical, but in each case some special feature has led to the choice of a gas engine and to the desirability of its retention.

Thus, at Newport, R. I., is a very interesting case of a 56 H. P. Otto engine used to drive an ice-making plant. Here the deciding condition in the choice was the existence in the hands of the local gas company of a surplus of land, buildings, gas-making capacity, and, at certain hours of the day, labor. The installation of the ice factory by a separate company, but in close connection with the gas company, turned all of this idle capital into earning capital. It is a significant illustration, although a pioneer, of the breadth of opportunity which is already forcing many industries toward as close and natural an alliance with the gas generator as is electro-metallurgy with our great water powers. This tendency is notably visible as to electric lighting.

Of perhaps greater interest, even to the purchaser of a factory plant, are those cases of special adaptation which show so plainly the possibilities and the limitations of the engine.

Probably the most promising of these is street railroad traction, not because the present state of the art is satisfactory, but because there is an undoubted demand for a street railroad system which shall make each car independent of any central station as to motive power and speed. Gas propulsion is attractive at present chiefly as an untied road toward the solution of this problem.

Roads operated by gas-motor cars now number at least five at Dresden, Dessau and Hirschberg, in Germany; Paris, France, and Blackpool, England, which are named in about the order of their installation, though of the Paris installation I have only hearsay evidence, and am not sure that the Hirschberg road is yet actually in operation. In each case the motors were built at Deutz, at the original Otto works.

The engine, of 12 to 15 H. P. at most, has two horizontal, single-acting cylinders facing a common crank and is situated under one seat, the fly-wheel occupying

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the plane of the car frame behind the passengers. It is accessible from the outside by folding doors, for starting by hand, and runs continuously while the car is in commission. The engine speed is normally 280 and is controlled by an ordinary governor; but during a prolonged stop this governor is adjusted by the motorman to hold the speed at 80 revolutions per minute until the power is again wanted. From the engine the power is transmitted to the wheels by variable speed friction-gear, countershafts and clutches. The gas is stored, compressed to 105 lbs. per square inch, in reservoirs under the opposite seat and under the ends of the car-body. About 120 cu. ft. of free gas are thus carried, but this could obviously be increased to advantage by increasing the working pressure. The average consumption is about 17 ft. per car mile for cars averaging 14 seats and standing room for 14, but this includes snow plows and similar incidentals. The available circuit before recharging is about seven miles. The latest report from the Dessau road, to be found in the *Zeitschrift der österreichische Ingenieur- und Arch. Verein*, 1897, page 590, gives a trial trip of about 8.7 miles in 39 min., with speed on a level of about 15 miles per hour, with a total consumption of 346 cu. ft. of gas. The motor car, with passengers, weighed 17,600 lbs., the trailer 17,800 lbs.; total, 35,400 lbs. This motor car evidently possesses greater storage capacity than did the earlier ones from whose service the first formal report was issued about three years ago.

It is interesting to compare with this the performance of the electric railroad at Lyons, France, which is driven by a Simplex gas engine working on Lencauchez gas. The road operates 10 or more cars and on holidays gives a two minute service for 18 consecutive hours to ten or twelve thousand passengers upon a total average consumption, including "banking," of 1,760 lbs. of coal per day.

While the directly-driven gas road would not satisfy American demands either as to size, maximum speed or acceleration, which last relies largely upon fly-wheel inertia, yet these figures are impressive as to fuel-cost, and the system is undoubtedly capable of development.

A similarly picturesque application is that of marine propulsion. In this country considerable has been done in the way of driving pleasure crafts by means of gasoline engines, as much as 30 H. P. having been installed in a single boat. But the only application to merchant marine service yet come to my notice is the use of a French Simplex engine to drive a barge on the Seine between Havre and Rouen, the fuel being gas compressed to 1,420 lbs. per square inch and stored on deck in 80 forged flasks, each tested to 2,270 lbs. per square inch, weighing 715 lbs., and containing 775 cu. ft. of free gas. The barge is of iron, 98 ft. 5 in. long, 18 ft. beam, 7 ft. 5 in. deep. The engine is a two-cylinder vertical, of about 40 H. P., and drives a propeller having movable blades of variable or reversible pitch. It runs always in the same direction and at the same speed, reversing or slowing being accomplished by the pilot from the bridge, without any co-operation on the part of the engineer. The speed attained, against a quite heavy sea, was 6½ miles an hour with a load of 160 tons. For further details reference may be had to *Le Genie Civil* for Jan. 26, 1895, or to *Progressive Age* for June 15, 1895.

A slight investigation of this field reveals the advantages of this system to lie (1) in a saving of labor, as the engineer's duties after once starting the engine consist merely in oiling it, and he can therefore serve as deck hand also; and (2) in saving of space and weight of machinery, the former being given in the above case as 27½ tons.

The disadvantages are the cost of fuel, except where the service might be undertaken either by gas companies owning works adjacent to the water and with surplus capacity of generator, or by some company strong enough to establish special fuel-gas generators along the line of traffic. For all these reasons the writer concluded that the only promising field now open to this industry was that of harbor tugs, where the cost of labor, facility in handling and concentration of power are important, but where the voyages are short and the traffic densely concentrated. Thus, one gas company in New York City could "provision" all of the tugs in the harbor with fuel from charging stations on either river, while the labor cost per tug would be reduced by an average of about 30 per cent.

These special applications aside, the one most important possibility in gas power is that of the production of electric current. While local conditions will vary the figures widely, it is now generally conceded that a greater amount of light, by 25 to 75 per cent., can be gotten from a given amount of illuminating gas by using it in a gas engine coupled to a dynamo and a string of electric lights, than by burning it in the ordinary way, or even with the aid of Welsbach burners. For some figures of actual tests in this line see *Railroad Gazette* for Nov. 26, 1897, page 833. The subject has been further discussed by Mr. Nelson W. Perry, formerly editor of *Electricity*, in a paper in the *Engineering Magazine* for November, 1896. The topic is too broad for more than mention here, but it is significant how clearly have already been defined the limits in commercial efficiency of the electrical transmission of energy, and that gas is the most promising champion for the responsibilities of longer transmissions.

After electric current generation, the widest application already firmly established is the driving of waterworks pumps, but it is confined almost entirely to the continent of Europe as to locality. Data regard-



ing the efficiency of these plants may be culled from the *Journal für Gasbeleuchtung und Wasserversorgung* if desired, but do not admit of general averaging here. Further instances of especial interest are the French gas-driven coal hoist, described in *Progressive Age* for March 1, 1896.

[TO BE CONTINUED.]

#### New York Railroad Commissioners' Report.

The Railroad Commissioners of the state of New York, A. W. Cole, F. M. Baker and G. W. Dunn, have issued the fifteenth annual report of the Board. The statistics are for the year to June 30, 1897.

The physical condition of the railroads is good, particularly that of the trunk lines. All recommendations made by the Board concerning defects have been promptly complied with. There have been no rate disturbances during the year and no general complaint on this subject has been received by the Board. "The Joint Traffic Association has succeeded in maintaining rate uniformity and stability" (1). The Board was represented not only at meetings of Railroad Commissioners at St. Louis, Mo., and Portland, Me., but also at the conventions of the street railroads, both state and national.

A summary is given of the business of the year ending June 30, 1897, as made up from returns sent in by the railroad companies, comparisons being made with the preceding year. These figures are, however, for the whole of the roads reporting, thus including a large mileage outside of New York state. The length of railroad in the state is 8,114 miles, an increase of 44 miles over the preceding year. The actual amount of new railroad built during the year was 58 miles (New York & Pennsylvania 27, Depew & Tonawanda 11, State Line 4, miscellaneous 16), but there were certain deductions from the total, including 14 miles of the Brooklyn, Bath & West End, now operated by electricity. The totals from the street surface railroad reports are as follows, cents omitted.

#### New York Street Surface Railroads.

	Year ending June 30, 1897.	Year ending June 30, 1896.
Capital stock.....	\$126,974,483	\$107,561,509
Fund-d debt.....	164,822,638	95,411,173
Unfunded debt.....	23,254,380	21,878,921
Cost of road and equipment.....	221,665,039	203,928,300
Gross earnings from operation.....	29,911,478	28,808,858
Operating expenses.....	18,117,799	17,845,759
Net earnings from operation.....	11,793,679	10,963,100
Income from other sources.....	1,262,358	1,428,192
Gross income from all sources.....	13,055,987	12,388,332
Taxes and miscellaneous.....	1,408,719	1,349,315
a Interest paid and accrued.....	5,391,037	4,614,835
a Dividends.....	5,387,161	5,466,632
Surplus for the year.....	604,506	479,078

The items marked *a* include respectively interest and dividends paid by lessors from rentals received from lessees as follows:

	1897.	1896.
Interest.....	\$1,549,001	\$1,263, 65
Dividends.....	2,581,064	2,086,698

The length of street surface railroads in the state June 30 was 1,179 miles, an increase of 88 miles during the year. The total length of elevated railroad, all of which is now within the territory of New York City, is 66 miles.

The report gives a brief statement of the principal laws affecting railroads passed in 1897. [These have already been noticed in the *Railroad Gazette*.] The new charter of New York City includes important provisions relative to the railroads within the city.

The general business of the Board, hearings, investigations, etc., has been greater than ever before. Where new railroads have been proposed the Board has, in every case, gone over the ground, and, where possible, hearings were given in the localities affected. All complaints have been promptly investigated, and whenever they led to a recommendation on the part of the Board to a railroad company the railroad promptly complied. The Board refused to grant a certificate of necessity to the Auburn & Western Street Surface Railroad and refused to review its own action in approving electric power on Amsterdam avenue, in New York City. Both these cases have been appealed to the courts.

The grade-crossing law is reviewed at length, and the action of Massachusetts on this question is recited. The Board recommends that New York state appropriate \$250,000 a year for this purpose, which is only one half the sum appropriated in Massachusetts, although New York has four times as many crossings. One railroad company having 42 grade crossings on its main line in New York has intimated that it desires to change them all as soon as practicable. (Presumably this is the Boston & Albany.) The report states that it is expected that the Long Island road will soon abolish 100 crossings without expense either to the state or to the towns. The total number of grade crossings in the state is 8,636.

One hundred and twenty-seven steam and street railroad companies have been organized since the present law (section 59) was enacted. Certificates have been granted to 59, fifteen applications have been refused, five are pending, and 38 companies have made no application to the Board.

Fifteen passengers, 142 employees and 485 other persons were killed on railroads in the state during the year, and 123 passengers, 857 employees and 411 other persons were injured. No passengers were killed by causes beyond their own control, and only 16 employees.

The number of grade crossing fatalities was 93, about the same as in the preceding year. "The great majority of these accidents result from the carelessness of drivers." The Commissioners think that "an amendment to the law requiring the driver of a vehicle to come to a halt before proceeding across the tracks of a railroad, and perhaps declaring his failure to do so to be a bar to the recovery of damages, might tend to promote public safety." Of the 15 passengers killed nine met their fate while getting on or off trains in motion, and it is suggested that the railroads ought to take more effective steps to protect travelers from their own misconduct. The use of gates on passenger cars, to be closed before the train starts, and kept closed until it stops, is favorably mentioned. The number killed while walking on tracks was 320, and the report sets forth the cause in its true light, the failure to enforce the tramp laws being the salient element. In the past 10 years the number of persons killed while walking on the tracks in New York state has been 2,824, which is equal to 43 per cent. of the total number of fatalities on railroads in the state.

Ten passengers, six employees and 48 other persons were killed on the street surface railroads of New York during the year, and 173 passengers, 27 employees and 123 other persons were injured. The Board has reason to believe that street railroad accidents are not fully reported, especially by the roads in the large cities.

Bridge repairs have been extensive on all the railroads, and wooden bridges will have given place entirely to steel ones within a year or two. Passenger stations have been well maintained, and much improvement is noticed in their sanitary condition. Concrete and stone platforms are taking the place of plank structures. Stations ought to be better lighted at night, especially at the smaller villages. The recommendation that passenger cars be always lighted with gas or electricity is repeated. A few Wagner sleeping cars are still lighted by oil.

Fires due to sparks from locomotives are no longer common, nearly all locomotives in the state being equipped with suitable screens. Freight cars, especially those coming from the West, are often found to have insecure grab-irons, and on many the brake wheel is not properly bolted to the brake stem.

"A satisfactory method of blocking guard rails and frogs has not yet been devised," but the Board hopes to be able to make a recommendation next year. During the year four persons were killed and six injured by their feet being caught in frogs.

The law of New York practically requires all freight cars to be equipped with power brakes by Jan. 1, 1903, but as trains can be properly controlled with only a portion of the cars fitted, the Board recommends that the law be changed so as to harmonize with the federal law. The Board has extended to Jan. 1, 1900, the time which the railroads may have to equip their freight cars with automatic couplers. A table is given showing the brake and coupler equipment of the freight cars of all the roads reporting to the Board.

The report recommends that street railroads be forbidden by law to admit to a car more persons than can be seated and can conveniently stand in the spaces between the seats. Complaints are received that street cars are started before the passengers get on the platform and before alighting passengers reach the ground. As cars now run at high speed passengers should not be allowed to ride on the steps, platforms or running boards.

A table is given showing the average traffic and earnings of each street surface railroad in the state. Average earnings are given per passenger, and average cost per car mile and per passenger.

New legislation recommended by the Board, other than that already mentioned, is summarized as follows:

An amendment to the Highway Law containing more stringent provisions relative to the removal of obstructions on highways where they intersect steam surface railroads at grade.

An amendment to subdivision 3 of section 4 of the Railroad Law authorizing railroad companies to trim up trees and clear out underbrush on private property at highway grade crossings where a clear view of the track of the railroad cannot be had because of such growth, upon making compensation therefor.

An amendment to section 36 of the Railroad Law empowering the Board to summarily compel steam and street railroads intersecting at grade to erect interlocking switch and signal devices and to apportion the expense therefor.

An amendment to the Railroad Law authorizing the Board to revoke certificates granted under section 59 if construction has not been begun within two years of the granting of such certificate after a hearing and a full investigation as to the cause of such failure.

An amendment to the Railroad Law providing that street surface railroad extensions, except within the limits of cities and incorporated villages, shall only be made after compliance with the provisions of section 59 in the same manner as if for the construction of a new railroad.

An amendment to the Railroad Law relative to applications of street surface railroads for a certificate of public convenience and a necessity, empowering the Board to certify to the whole or part of the route proposed by a new corporation.

An amendment to the Stock Corporation Law further restricting the issue of stock and bonds by railroad corporations.

An amendment to the Trespass Laws requiring the punishment of persons arrested for stealing rides upon freight or passenger cars or walking upon the tracks of steam surface railroads.

An amendment to the Railroad Law requiring the posting of passenger train timetables in all stations.

An amendment to the Railroad Law more clearly defining the character of fences to be erected by railroad companies between railroad and private property.

An amendment to subdivision 6 of section 49 of the

Railroad Law, authorizing the Board of Railroad Commissioners to determine where the tools now required to be carried shall be placed in passenger cars.

An amendment to section 33 of the Railroad Law, directing the Board of Railroad Commissioners to adopt a standard crossing sign, and compel its use at highway grade crossings.

An amendment to the Railroad Law, compelling the erection of whistle posts not less than 1,500 ft. each side of every highway grade crossing.

#### Connecticut Railroad Commissioners' Report.

The Railroad Commissioners of Connecticut, W. F. Willcox, W. O. Seymour and O. R. Flyer, have issued the 45th annual report of the Board. The railroad statistics are for the year to June 30, 1897, and those of the street railroads are for the year to Sept. 30, 1897. The year has been uneventful as far as the steam roads are concerned, no new lines having been projected or built. The use of electric cars on the New England road, with a third rail for electric traction, and the proposed use of a steam motor passenger car on the same road are discussed.

The injunction brought by citizens of Bridgeport against the plans of the New York, New Haven & Hartford for elevating its tracks has been dissolved, but certain landowners interposed further legal delays and a decision will have to be had from the Supreme Court of the state before the road can go on with the improvement.

One passenger, 27 employees and 103 other persons were killed on the railroads of Connecticut during the year, and 28 passengers, 193 employees and 101 other persons were injured. The number of employees injured in coupling or uncoupling was 70, as compared with 87 in the previous year. The number of highway grade crossings in the state is 1,015, which is 15 less than in 1896. The number of under crossings is 227, and overhead 201.

The traffic and financial statistics are for the whole of the lines operated by the companies reporting, so that the totals for Connecticut cannot be separated. The length of road in Connecticut is 1,008 miles, and the amount of taxes paid to the state was \$874,437.

The statistics of electric railroad lines, which, presumably, are all within the state of Connecticut, are as follows:

#### Street Railroads in Connecticut.

	1897.	1896.
Miles of line.....	362	329
Miles of track.....	386	351
Capital stock.....	\$9,770,140	\$9,321,740
Bonds.....	9,092,800	8,690,110
Floating debt.....	1,071,421	849,256
Stock, bonds and funded debt per mile of track.....	51,681	51,681
Cost of road and equipment.....	19,849,207	18,585,261
" per mile of road.....	54,829	54,829
Gross earnings.....	2,626,228	2,589,619
Operating expenses.....	1,708,997	1,704,725
Net earnings.....	951,412	885,122
Interest.....	468,926	417,060
Dividends.....	265,636	221,120
Gross earnings per mile of road.....	14,004	14,004
" per train-mile, cents.....	19.6	19.6
Operating expenses per mile of road.....	4,721	4,721
" per train-mile, cents.....	12.76	12.76
Taxes paid.....	\$132,937	\$128,131
Miles run.....	13,398,305	12,597,085
Passengers carried.....	52,746,357	52,789,791
Average passengers per mile run.....	3.91	3.91
Persons employed.....	1,967	1,785
" killed.....	14	20
" injured.....	182	270

The taxes paid by the street railroad companies in Connecticut, in the year reported, were equal to 5 per cent. of the gross earnings and to about two thirds of one per cent. of the reported cost of the property. The amount of taxes paid to the state was \$120,765.

The appendix to the report contains, besides the statistical tables, the reports of each company and decisions of the courts affecting railroads interests, a full reprint of the paper on the application of electrical power on steam railroads, which was read by Colonel N. H. Heft at Toronto last summer.

#### How to Succeed in the Railroad Service.

"In the early days of railroading it was a vocation, now it is a profession. As the railway systems expanded the enormous business of each company compelled traffic departments, freight and passenger; auditing, financial, construction, roadbed and bridge departments. The operation of the road called for general managers, superintendents and assistant superintendents; and a lawyer of distinction, supported by a large number of assistants, who should devote themselves entirely to the legal business of the company, had to be employed everywhere.

"The railway profession presents more attractions for a young man than any other line of business. It has greater opportunities for advancement, and its employment is more permanent. To succeed in it in any department requires health, brains, honesty and equipment. The young man must make up his mind that if he would rise in the profession, he must never question the kind of work that is put upon him, the hours which are required of him or the places, agreeable or disagreeable, to which he is assigned.

"The young man who proposes to enter railway service should first decide whether he will take his chances for a career in outdoor or indoor work. If outdoor work, which is in the operating department, he will be immensely assisted if he has had the opportunities which are offered in the technical schools. In these days of thorough training it is almost impossible for a young man of ordinary education to get on in competition with the graduates of the Sheffield Scientific School at Yale, the scientific schools of Columbia, the special education of Cornell, the big advantages of the Troy Polytechnic and the Stevens Institute, and the instruction given in many other of the schools and colleges of the United States.

"If he selects indoor work, he must make up his mind

\*From a paper by Chauncey M. Depew, President of the New York Central, in *New York Railroad Men*.



that much more will be required of him, at first, than in commercial lines. If he is in the treasurer's department, and shows special efficiency and intelligence when a vacancy occurs in the freight department, in any discussion that should happen between the heads of these departments he is almost certain to be drafted for a better position by the traffic manager, and *vice versa*.

"Railroading differs from no other business or profession in its beginnings. The salary is small. The work is hard. It is only the few who, by cheerful readiness at all times to perform their own tasks and to stay several hours—and, if necessary, all night—to meet the requirements of the office, or to do the work of the lame, lazy and incompetent, attract the attention of their superiors and are marked for promotion.

"When once, in any department, the young man has impressed upon the head of it his usefulness and fidelity, his career is made. With the rarest exceptions, the heads of all departments in the railway service of the United States have come up from the ranks. The presidents of all the railroads have known the day of small things and been many years reaching their positions. The superintendents have all come from the brakes or from carrying the rod and chain in the engineering service. The superintendents of motive power have come from the footboard. The master mechanics have all come from the bench. Traffic managers and treasurers have all begun as clerks. There are but few heads of departments on our own road who have not risen from the ranks. In the operating department the general manager began as a brakeman, the general superintendent and two of the superintendents as telegraph operators, one superintendent as agent and one as a clerk in the superintendent's office.

When a locomotive is perfectly balanced on the turntable the load tends to deflect downward the ends on the longitudinal members, and to provide for the stresses set up under such conditions each longitudinal member is trussed on the upper side by means of a 1x3 in. plate forming a tension member. Also, when an engine is moved on or off, the table is supported at the center and one end; to provide for such conditions each longitudinal member is trussed on the lower side between the center and ends by means of a 1x3 in. plate which acts as a tension member.

The arrangement of the center bearing, which is clearly shown, consists of eight rollers, 6 in. long, carried on a spider frame. There are two carrying wheels at either end which run on a circular track. The table is adjusted vertically by means of a center pivoted screw.

#### The Signal Engineer.\*

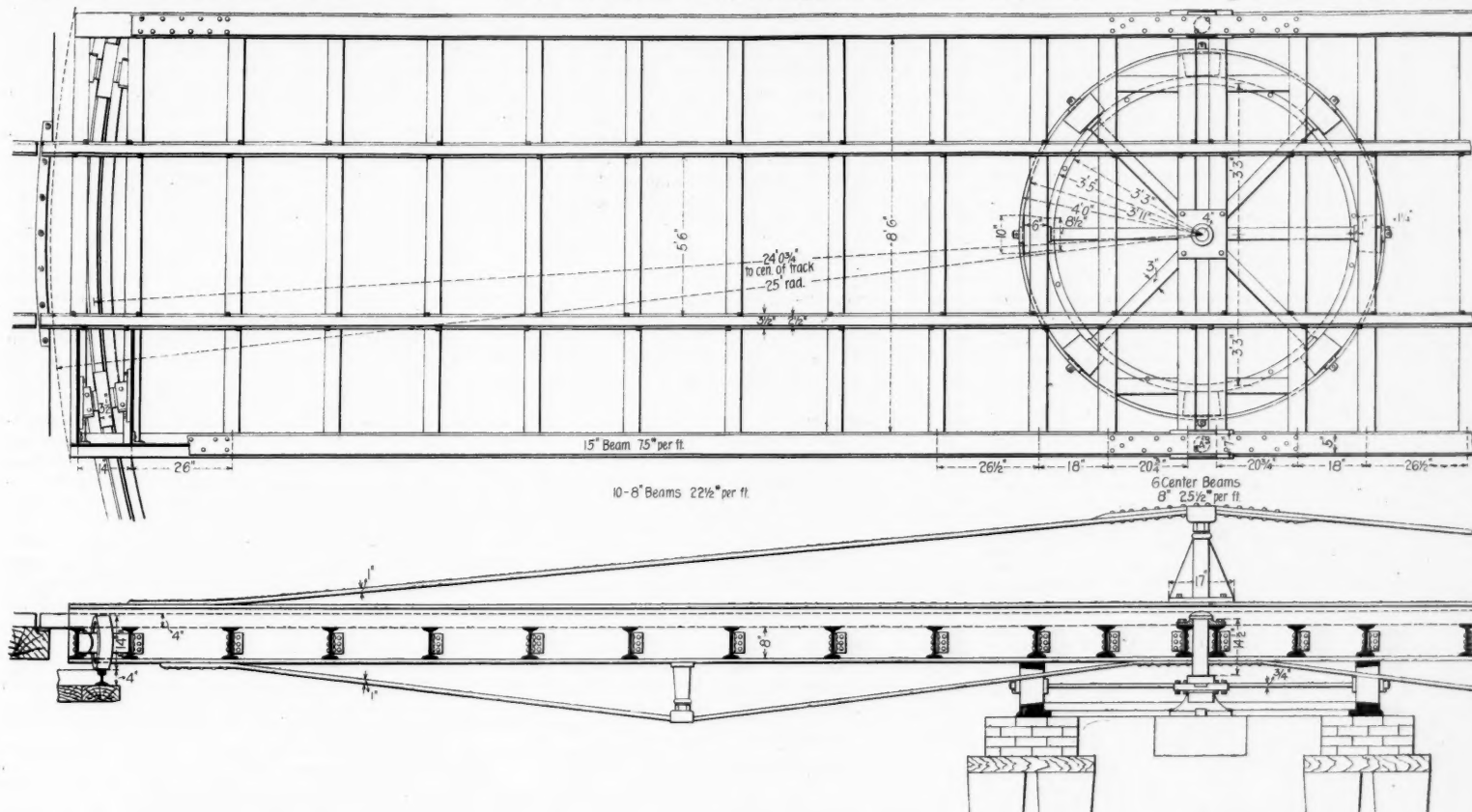
Now that railway signaling is fast approaching the dignity of a separate department in the operation of a railroad, it behooves us, as representatives of such departments, to endeavor to define the duties of such an office, to the end that a proper recognition may be had

the work; the one relating solely to the number of men employed, and the other the standard whereby the efficiency of the organization is to be measured.

The Signal Engineer should report to the office which will bring him in the most direct contact with the operating official most concerned in the efficient work of the signals. This official on the majority of roads is the General Superintendent. He is the man who is charged with the proper operation of the road, and should decide what signals to use. This plan is in satisfactory operation.

With the Signal Engineer reporting to one of the other officials, he must get his orders at the best from one not immediately concerned as to the efficient working of the signals, and who in many cases approves plans and signs requisitions without really looking into the subject as it deserves. With the Signal Engineer doing all of his business with the Superintendent, and receiving his orders from an official other than a Superintendent, either the efficiency of the arrangement will not be what it should be, or else the system will degenerate into a mere matter of form, the Signal Engineer being the actual head without the responsibility.

In the organization of the forces of the signal department, no two roads will be found to have the same plan of distributing the labor force for making repairs or for putting in new work. On one road the work may be



New 50-Foot Turn-Table for Light Locomotives, to go to Japan—Made by the Toledo Foundry & Machine Co., Toledo, O.

"Vacancies are the inspiration and hope of those who desire and work for promotion. Sometimes a young man will do very well at first, out as soon as he reaches a place of some importance he overestimates the hold which he has and the strength which he has attained in the confidence of his superiors. He will be often absent from the office. He will take frequent vacations. He becomes restive under rigid hours and over-time. His superior discovers that he often takes advantage of the necessary absence of his chief to be absent himself.

"In the service everyone's eye is on everyone else. There is a generous appreciation of comradeship; at the same time there is severe criticism of the conduct and character of fellow-employees and officers. The moment an officer becomes careless of his duties, inattentive and out of reach when wanted, his chances of promotion are over; and the accident of a discharge or displacement are imminent. The chief mistake of the ambitious young man is in regarding the necessity for extra effort, care and attention lessened because he has been promoted to better and more important positions.

"It is in these stages of consciousness that many a promising railway officer loses all the advantages of his previous hard work, incurs the displeasure or distrust of his superiors and makes it impossible, even if he reforms, to advance him. There is but one rule of success in railway service, and that is, no matter how high you get, once a hustler, always a hustler, a hustler until you die or resign."

#### Turntable for Japan.

The Toledo Foundry & Machine Co., Toledo, O., has designed and is now building a 50-ft. turntable for a railroad in Japan, the drawings of which are here shown. This turntable is to be used for turning light locomotives, weighing approximately 50 tons. The important features of this arrangement are simplicity of construction and the doing away with the deep pit made necessary where deck girders are used. With the shallow pit expensive retaining walls are not needed, and no provisions are necessary for drainage.

By reference to the drawings it will be seen that the two longitudinal members are 15-in., 75-lb. steel I-beams, placed with the inside flanges 8 ft. 6 in. apart. The floor beams are 8-in., 22½-lb. steel I-beams; the track gage is 3 ft. 6 in.

of the responsibility of the position, and that the forces may be so organized that the best results will be obtained.

It is hard to find any two roads on which the duties and power of the man in charge of the signal department are the same, and there is great dissimilarity in the titles. With nearly all roads the development of the signal department has been slow, the first few signals installed being cared for by some one of the larger departments, usually that of the Chief Engineer, and any expert opinion in regard to signaling or apparatus being given by the signal companies, all active in introducing their several devices. This, however, proved unsatisfactory, and questions came up that practically compelled the railroads to appoint men capable of giving an expert opinion on these subjects and who could also take charge of the signal repairmen.

Signal Engineers report to the Chief Engineer, to the Superintendent of Bridges and Buildings, or one of the operating officials, according to the particular department that the work had first been placed under. In some instances the different branches of signal work are divided among several departments, the electric signals being looked after by the Telegraph Department, block signals by the Building Department or some operating official, and the interlocking work by the Chief Engineer's Department.

Taking it for granted that the signal work on a road is sufficiently large to warrant putting a man in charge of it with some sort of title, the principal factors in determining the status of this individual are, first, the official to whom he will report, and second, the organization of the forces for the proper maintenance of the several signal systems. The organization of the force has to do with, first, the disposition of the force for making repairs, and second, with the consequent cost of doing

looked after by regular repairmen, who are stationed at some central point and who take care of general and other repairs, make adjustments, and when there is no work to be done put in their time inspecting. On another road the men may be distributed among the different plants or groups of signals, visiting each one at stated periods and putting in their whole time at such places, whether there is work to be done or not. When large repairs have to be made, extra men will be hired. Other roads again may have men for general repairs and new work only, and require the towermen to take care of the plant and make all the adjustments and minor repairs that one man can take care of. The first and last methods described are practically the same.

As between the first and second methods, there is a great difference in the cost of caring for a plant, because a properly installed plant does not require much repairing, and the repairman's time is mostly put in cleaning the plant, traveling or doing nothing. If there is much to be done, one man cannot make the repairs by himself but has to have help, as the work must be done quickly in order to keep the plant in service. Then again the hiring of additional help for an occasional job is objectionable, as it seldom happens that the same man can be obtained twice, while with new men the work is likely to be but indifferently performed. It is seldom that extra men are provided with the necessary tools, or that they will take proper care of tools furnished them.

The men usually put in the tower to operate the plant have had no mechanical experience, and are usually slow in acquiring a knowledge of what to do in case of accident or derangement of the apparatus. They are not hired by the Signal Engineer, and will try to shift responsibility to the Signal Department for any accident that may occur. By not taking an interest in the mechanical construction of the plant they often occasion unnecessary delay to trains by not knowing where to look for the cause of the trouble when anything is wrong with the plant. Particularly is this the case with plants having electric locking, or where there are

\* A paper by W. H. Elliott, Signal Engineer, Chicago, Milwaukee & St. Paul, before the Railway Signaling Club, Chicago, Jan. 11, 1898.



very long pipe lines. The remedy for this state of things is to put the control of the towermen under the Signal Engineer; he can then see to it that only the right kind of men are provided.

It is to the interest of the Signal Engineer to have all signals of whatever description controlled by his department. Fewer men will be needed to keep them in repair, and the proper relations of one kind with another will be maintained more satisfactorily. Proper specifications will more likely be prepared and standards maintained, while no opportunity will present itself for a shirking of responsibility by the department in charge. There will also be no doubt on the part of the Superintendent or other official as to which department certain work is to be referred to or which department is to be called on when the signals need attention.

#### The Best Type of Locomotive.

There is much truth in the remarks made by Mr. G. W. Rhodes, Superintendent of Motive Power of the Chicago, Burlington & Quincy Railroad at the December meeting of the St. Louis Railway Club. The topic which Mr. Rhodes was called upon to present was, "What type of locomotive, considering present conditions, is the most economical for passenger and what for freight service." The following is from Mr. Rhodes' discussion:

I would say, in a general way, that for railroads in our immediate surroundings, beyond any question, the best engine for both passenger and freight service is what is known as the four-wheel connected 17 or 18 x 24 in. American engine; that is a good engine for pioneer roads and for roads that have not been rebuilt. I want to lay a great deal of stress on the fact that it is the condition of a railroad which governs the question as to what is the best passenger engine and what is the best freight engine.

Formerly it was the practice to send specifications and drawings to the locomotive builders, and the builder would simply build the engine. That method is gradually changing and the practice that we are gradually getting into is to specify a condition. To specify a condition in time that the trains are expected to make between two points; to specify the character of rail that is laid; to specify the character of grade, the weight of the trains and the curvature, and then to ask the locomotive builders to build the engine that will do this work and also guarantee that the engine will perform it, and the payment is not made until the engine does perform it. So it is pretty clear, I think, that the conditions govern the question as to what is the best passenger engine and what is the best freight engine.

There is another feature of this subject, as to the change which improved conditions of the road will bring about in engines. I think that it is often the case that new engine construction has been spoiled by the overconfidence of the motive power men, and very often the overconfidence of the manager of the railroad, in the representations which are made to them requiring a new type of engine. My experience has been that when a new engine is built, whether it is built at a railroad company's shop or whether it is built at the shop of a locomotive builder, it will be found that in a great many particulars the engine is decidedly weak; that the best calculations have not been able to make the engine strong enough; at first in one part and then in another part the machine fails, and then a third part will fail, and as those failures occur the parts are strengthened, and finally, after a few years' service, this new type of engine is reconstructed and rebuilt in such a way that it is strong enough to go into general service and you are ready to have more engines of that class built.

Now, the mistake that is made very often is in the overconfidence of some builder or the overconfidence of some superintendent of machinery, who will order a dozen or fifteen or twenty engines of a new type, and then, in place of having these failures occur on a single engine, they occur on twenty or thirty, the effect being that it practically condemns the entire lot after being used on the road, whereas, if but one engine had been purchased, it might have been worked into a good engine by remedying these defects as they were discovered. Therefore, I would advise those who wish to make a change in their type of engine not to build fifteen or twenty of the same kind at once, but confine themselves to one, and make a thorough test of that one engine before introducing a large number on the road.

With reference to the same question, the following extract from the remarks of Mr. J. W. Stokes, Master Mechanic of the Illinois Central Railroad, may be of interest:

In the United States there is a wide range of diversity in the designs of passenger engines. The mountainous and hilly sections require engines so built as to be able to maintain a given maximum speed up grade. This calls for heavy locomotives with great adhesive power and more than four driving wheels, so that moguls, ten-wheel and in some cases consolidation and decapod engines are found in use for passenger service. In these cases the diameters of drivers are usually restricted to comparatively small sizes to prevent the loss of power incident to slipping. In the prairie sections the American type of engine is almost exclusively used, and the growing tendency of recent practice is to use high wheels and great weight.

Engines of this class are being employed on all important through trains, and this seems to have settled the question for the present as to the most satisfactory type for comparatively level sections. In the Eastern States and the eastern section of the Middle States there has been more experimenting in search of a satisfactory type of passenger engine, than in any other part of the United States, where the conflict is between some type of European or English and the accepted type of American locomotive. It would appear, from recent practice, that the American type will displace single driver with trailer, the 10-wheel, the wide firebox and many other departures that are being tried.

It is pretty certain that the American type of engine will be retained as the favorite in practice on the greatest mileage of the United States, until the compound is so far perfected as to have established a permanent and admitted superiority in its general efficiency, as well as its greater fuel economy. As the triple and quadruple expansion engines are now and for some time past have been displacing simple engines in marine and stationary practice, wholly on account of greater economy, it appears reasonable to predict that the same thing will follow in railroad practice. The conditions of service as between marine and stationary service as compared with railroad prac-

tice are such that radically different mechanism will be required. Some designers claim that they have accomplished the needed designs to make compound engines more economical and fully as efficient as any of the best designs of simple American type engines; but we are as yet in the tentative stage so far as the compound is concerned, and it cannot be claimed to have occupied any fixed place in the present field, although there are a considerable number of compounds being used in passenger service.

#### The Status of the Northwestern Elevated Railroad, Chicago.

Little information regarding the status of the Northwestern Elevated Railroad has been made public for some time, so that we present the following data from the annual report of the President to the stockholders of the Columbian Construction Company which was organized to build the road.

Since the last annual meeting the only work done has been the erection of the iron work, which was at that time on the ground, being 4,400 ft. of four-track structure extending from Dayton street to Fullerton avenue, and 2,400 ft. from Grace street to a point just north of Buena Park Station; making a total of 1.3 miles erected during 1897, and 3.2 miles of four-track structure altogether. When completed, there will be in the main line 0.92 mile of double-track structure from Institute Place to Lake street, and 5.52 miles of four-track structure from Institute Place to Wilson avenue, making the entire structure 6.44 miles long. In addition to the main line there will be 1.31 miles of single track and 0.21 mile of double track used for inclines, storage tracks and switching tracks at terminals. The total track mileage, including main line and terminals, will be, when completed, 25.45 miles.

The iron work for five miles of line has been turned out by the mills, and there yet remains to be made the metal work for 1.44 miles to connect the present structure at Dayton street with the Union Loop. The metal work already completed will suffice for 80 per cent. of the remaining structure to be erected, and 10 per cent. of the required material is now on the ground. Fifty-one per cent. of the entire length of the structure has been erected, and all but about 16 per cent. of the entire foundation work has been completed. The Wells street bridge has been rebuilt and is ready for the laying of track. None of the material needed for stations has as yet been supplied.

On Dec. 29 the Chicago City Council granted the Northwestern Elevated an extension of the original ordinance of one year in which to finish the work, so that by the new ordinance the road must be completed by Dec. 31, 1898. Much difficulty has been experienced in making suitable financial arrangements for completing the road, and it is estimated that \$3,500,000 is the amount needed to finish the work; up to the present time \$6,290,611 has been expended. It has been proposed, and the plan will probably be carried out, that the Northwestern Elevated assume the obligations of the Columbian Construction Company and itself complete the remaining work, in which case the road will be directly bonded for an amount sufficient to cover the cost of the remaining work.

#### The Anti-Scalping Bill.

Hearings were resumed at Washington on the anti-scalping bill on Jan. 13. George W. Boyd, Assistant General Passenger Agent of the Pennsylvania, presented additional evidence to substantiate his former testimony concerning the dishonest practices of ticket brokers. Senator Tillman asked if excursion tickets were not a means of discrimination, but Mr. Boyd explained how they were open to all purchasers.

George H. McKenzie, the ticket broker who testified several weeks ago, was again before the committee. He said that the indictment found against him in St. Louis in 1882 was quashed, and that the railroad men who examined his books completely exonerated him; moreover, he brought suit for malicious prosecution and recovered \$600. Mr. McKenzie presented affidavits from St. Louis, Chicago and Cleveland brokers to the effect that they had purchased quantities of thousand-mile tickets from the agents of the Pennsylvania, to be sold on commission. The Chicago broker, Albert J. Geis, swore that he received in commissions from the Pennsylvania \$136.75 in six months. In connection with this Mr. Boyd said he had no authority to speak for the Pennsylvania lines west of Pittsburgh; the mileage books referred to by the brokers were bought from the Vandalia, a separate company, now in the hands of a receiver.

On Jan. 15 the Senate Committee listened to a statement by Albert Lyon, editor of the *Commercial Traveler*, St. Louis. Mr. Lyon contradicted the statements of Mr. Dow, of New York, and others, who opposed the passage of the bill, and who claimed to represent 350,000 traveling salesmen. Mr. Lyon is sure that the great majority of traveling salesmen favor the bill.

Mr. McKenzie presented affidavits from ticket brokers in various cities to the effect that they bought tickets directly from the railroads. He said that the business of himself and his partner amounted last year to \$660,000 and in 1894 to \$1,380,000, five offices being maintained. In that year their net profits were about \$37,000. Being questioned closely about his personal relations with the railroads, and whether or not he was receiving commissions from them, he said that he had been away from his office several weeks and could not tell the exact condition of things. The only road he would name was the Wisconsin Central, and he ad-

mitted that he had not for a long time done business with the Pennsylvania.

The House Committee having in charge the Federal anti-scalping bill has agreed upon two amendments, one providing for a penalty for refusing to redeem unused portions of tickets, and the other in limiting the amount payable in redemption, so that the passenger shall not be relieved from paying the regular rate to the point where he ended his journey.

The Senate Committee has been authorized to take testimony under oath and to send for persons and papers.

#### "Long and Short Haul" in England.

In the official summary of the eleventh annual report of the Interstate Commerce Commission printed by the *Railroad Gazette* on Dec. 24, there is a reference to English law and practice as to long and short haul. As the Commission has apparently misconceived our law and misunderstood our practice, and as everyone will agree that a foreign precedent can only be valuable if it is correctly cited, perhaps I may in a few words state the actual facts.

The Commission says: "No English court has ever yet held that the words 'same circumstances' in the English Act relate to competition," and then, after stating that in trans-Missouri territory the long haul rates are now lower than the intermediate rates, it adds: "It is believed that in no other part of the civilized world is such a proceeding tolerated."

Now, the only English Act relating to railway traffic in which these words, "same circumstances," occur, is, to the best of my belief, the Railway Clauses Consolidation Act, 1845. This Act, by Section 90, provides that "all tolls . . . shall be charged after the same rate . . . in respect of all passengers and goods . . . passing only over the same portion of the line of railway under the same circumstances." In other words, it applies only where the hauls are identical, and has no application—as has been expressly decided by the House of Lords—where the hauls are different, even though the one haul be included in the other.

The only statutory notice of this latter subject is in section 27 (3) of the Traffic Act of 1888. This subsection provides that "the Court of the Commissioners shall have power to direct that no higher charges shall be made to any person for services in respect of merchandise carried over a less distance than is made to any other person for similar services in respect of the like description and quantity of merchandise carried over a greater distance on the same line of railway." It will be seen that this subsection is merely enabling.

To the best of my knowledge the Railway Commission has never yet been so much as asked to put its power in force. All over England the short haul is habitually charged more than the longer haul in which it is included; wherever—to use the phrase which the Interstate Commerce Commission objects to, but which apparently the Supreme Court approves—"competition justifies the lower long haul charge." For instance, Exeter to Plympton (48 miles) 8s. 9d., to Plymouth (52 miles) 7s. 10d., to Lidford (75 miles) 7s. Or, again, another Great Western instance, on the main line up to London, Exeter to Uffington (127 miles) 16s., to Didcot (142 miles) 16s. 9d., to Reading (158 miles) 17s. 6d., to Slough (176 miles) 18s. 6d., to Southall (185 miles) 19s., to Paddington terminus (194 miles) 15s. 9d. In fact the differences of rates to local stations are even greater than here appear. For there are innumerable special rates, always lower, and often very much lower than the ordinary class rates such as I have here quoted, available at the great towns but not at intermediate roadside points.

That such a method of rate making is not only "tolerated" in this country, but taken very much as a matter of course I have already said, and I believe we are entitled to regard England as forming "a part of the civilized world."

Personally I should like to go further and ask why it should not be regarded not merely as tolerable but as right and proper. Assume, for example, which is not denied, that 7s. 10d. is a reasonable rate to Plymouth. Why should not 7s. be charged to Lidford? Doubtless the Great Western would like to charge more, but it cannot, as Lidford is only 36 miles from Exeter by a rival railway route. Suppose your long and short haul clause put in force, it is impossible to imagine the Great Western reducing its rate on the important traffic to Plymouth in order to retain its share of the petty business of Lidford. The Great Western then would simply put up the Lidford rate to the Plymouth level, and so in fact go out of the Lidford business altogether. And yet the Interstate Commerce Commission is not, I fancy, a believer in the advantages of abolishing competition.

I ought to apologize for occupying your space with a discussion of what I had fancied a somewhat elementary proposition. But really one so often sees the equity of principle underlying the long and short haul clause assumed as self-evident that I cannot refrain from asking what is the foundation of economic or commercial justice on which it rests. That where circumstances are the same rates should be the same, we can all agree. But where competition exists, are the circumstances the same? And, if so, what prevents competition from being a circumstance?

I see that the Interstate Commerce Commission further states that "pooling does not appear to be much resorted to in England, and under conditions there existing there is little or no occasion for it." In a paper which I had the honor to contribute to your columns a few



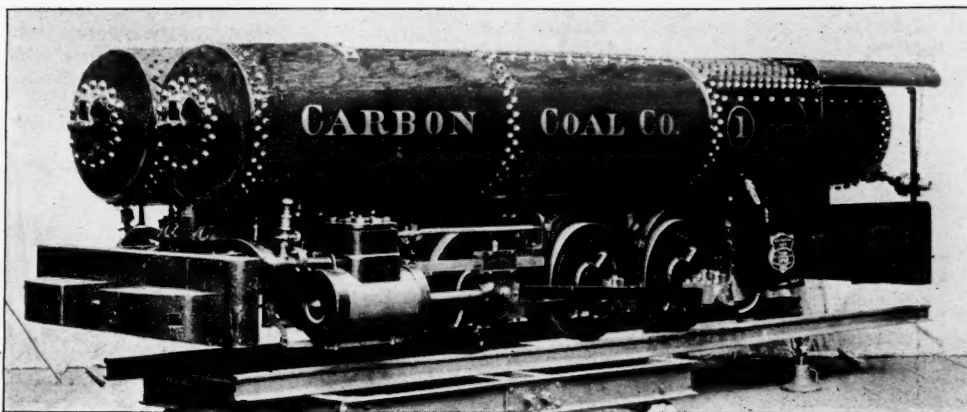
weeks back I showed that in fact pooling is a good deal resorted to, and that agreements to maintain equal rates are quite universal. But with all respect, I should have thought that from the American point of view the important thing was not the extent to which English railways do in practice pool, but the fact that they are able lawfully to enter into pools when, where and how they please, without public control, without even public notice, and that there is no desire on the part of any section of the public to abridge this liberty which has not been found by experience to work any public injury.

W. M. ACWORTH.

EXETER, England, Jan. 5, 1893.

## Compressed Air Mining Locomotives.

H. K. Porter & Co. have recently completed three compressed air mining locomotives similar to the one shown by the accompanying engraving. Two of these will very



New Compressed Air Mining Locomotive—Built by H. K. Porter &amp; Co., Pittsburgh, Pa.

soon be used in the Rolling Mill mine of the Cambria Iron Co., at Johnstown, Pa., while the third one, which is here-with illustrated, has been built for the Carbon Coal Co., of Greensburg, Pa. The Cambria Iron Co. was unwilling to install any system unless they were assured of its absolute safety, and compressed air was consequently adopted as the motive power.

About 10,000 ft. of pipe line will be used in the mine and will carry a pressure of 850 lbs. per square inch, the air for which will be compressed by an Ingersoll-Sergeant compressor. The locomotives have a very massive frame and bumpers, being built throughout for very severe service. The weight complete is 27,000 lbs. The cylinders are  $9\frac{1}{2} \times 14$  in. and the drivers 26 in. in diameter. The two locomotive air tanks, which have a combined capacity of 187 cu. ft., are sextuple riveted, 33 in. in diameter and made of steel plates  $\frac{5}{8}$  in. in thickness. The working pressure in the cylinders is 700 lbs. per square inch. The storage pressure in the auxiliary reservoirs is 5,780 lbs., and the metallic charging connections throughout are designed to stand the heavy strain to which they will be subjected. The height of the engine above the rails is 5 ft.  $3\frac{3}{4}$  in.

## Small Locomotives.\*

Has the small engine seen its day? This is a question so much dependent upon local conditions that it cannot be answered definitely yes or no, and might be supplemented by the question: "Has the large engine seen its limit, and is it the engine to be desired for all classes of service?"

The majority of the small engines of to-day are the remains of what was once the main equipment of many of our railroads, and it is their light weight and low boiler pressure that makes them small. In merchandise freight and stock trains, and in fast passenger and mail service these engines are outclassed by the large engine, and they failed principally because of their lack of boiler capacity.

The principal advantages of the large over the small engines are: First, they haul more cars; second, it costs less per car mile in wages to haul them.

The amount of fuel per loaded freight car mile is about the same whether the engine be large or small. The cost of repairs of the small engine is decidedly in its favor. Therefore, in comparing large and small engines in freight service, there is little choice so far as fuel consumption is concerned. The extra cost of repairs of the large engine is entirely overshadowed by the saving in train crews' wages, and in its extra earning capacity, so that for average main-line work the small engine has seen its day. On the Northern Pacific the purchase of 50 heavy engines has been the means of laying up 95 small engines. What the saving has been I am unable to learn, but it must be large enough to fully warrant the change. Where the traffic is large and the grade heavy, as it is in portions of the Northern Pacific, the large engine has become a necessity. About 25 per cent. of the savings in engines has been accomplished by making longer runs. Some of the more level roads have adopted the medium-sized engines, and have spent money in leveling and straightening their permanent way that otherwise would have been spent in the purchase of larger engines. On such a road the medium-sized engine will haul almost all the cars that can be put behind it, and in many cases the length of the train is limited by the length of the sidings.

The small engine is still being used on branch lines where the freight business is not large enough to warrant the use of a large engine, and where, in many cases light track and light bridges would not permit of the use of large engines even if the service demanded it. For branch passenger work and light suburban service

the small engine answers every purpose, and will be maintained for that class of service. The great disadvantage of the small engine of to-day is its low boiler pressure, and the small engine of the future will be one which is capable of carrying 160 to 180 or more pounds of steam. That there are two many small engines to-day there can be no question. Many of them will be replaced by large engines, and a few will be rebuilt with boilers capable of carrying high pressure.

In conclusion, the size of an engine depends upon the service required of it, and for certain classes of work the small engine is just as much in demand to-day as it was 20 years ago.

## Handling Ashes and Cinders.

The Baltimore & Ohio Southwestern Railway has devised an arrangement for cleaning locomotives at terminal and division points which promises to result in a considerable saving. An ordinary ashpit about 45 ft. long is provided with two large pans holding about three cubic yards each, which are placed in the pit. One

under the locomotive ashpan and the other under the front end; into these the ashes and sparks fall. These pans are of sufficient capacity for cleaning three locomotives and when full are lifted by a crane and emptied into a car which stands on a track alongside the pit. The pans are made with drop bottoms, held in place by a latch, to be worked by the man who handles the crane.

The power necessary to lift the pans is supplied by the locomotives. When the pans are full the hoisting chain of the crane is made fast to the locomotive, and as the engine moves off the pit, the pans are raised. The crane is then swung around to bring the pans over the car and the drop bottoms are released.

The cranes used for this work were built of old bridge material, heavy Phoenix columns being used for the posts. The posts go about 8 ft. below the surface of pit tracks, and near the base are strongly braced and anchored in concrete foundations making unnecessary the use of guy ropes. The hoisting chain passes over a sheave at the top of the post and is carried down through the column to a second sheave at the base for changing its directions, thus allowing the crane to swing freely in any direction.

The cost for handling cinders by this method is not definitely known, but the following statement will give an idea of the relative economy of the new and old arrangement. Two men during the day and two at night were required to clean the locomotives on the cinder pits at the shops at Washington, Ind., where a depressed track was used for the cars being loaded, into which the cinders were shoveled. Since cranes were put in at this point one man during the day and one at night have been able to do all the work, resulting in a saving of \$70 a month. At the Park street engine house, Cincinnati, a similar reduction in the force was made, resulting in the saving of \$80 a month.

## Vertical Hollow Chisel Mortising Machine.

The accompanying illustration shows a new vertical, hollow, chisel mortising machine, with a boring attachment, recently brought out by the Atlantic Works, Inc., of Philadelphia, and designed especially for the lighter class of mortising work as frequently met in car builders' and railroad shops. The weight complete is 4,000 lbs. The stroke of the chisel arm, which is regulated for the depth of mortise by a simple device, works automatically and makes 35 full strokes a minute. As the stroke is shortened the number is increased and the speed of the return is correspondingly increased. The chisel has a range across the work of 12 in. and the machine will admit timber 12 in. square. The table has a horizontal adjustment of 3 ft. and vertical adjustment of 14 in., and is provided with a vertical boring spindle which moves across the surface of the table by means of the lever shown in the illustration. The tight and loose pulleys are 12 in. in diameter with 5-in. face and are designed to make 800 revolutions a minute.

## Comparative Rates of Acceleration.

BY GEO. L. FOWLER.

In an article giving in detail the results of "Some Studies in Speed and Accelerations of Various Motors," that was published in the *Railroad Gazette* on March 19, 1897, I stated as a conclusion to the experiments "that the commercial (electric) motor, as we find it in com-

mon use, is not adapted for a rapid acceleration to high speeds or the maintenance of those speeds on a level, even if favorable grades should render their attainment possible. This statement, however, must not be taken as a denial of the possibility of building a high-speed motor, but merely in the form of an assertion that they could not be found working, at least, in the vicinity of New York." I also quoted in the same article, from a letter by an electrician, to the effect that high-speed electric service was, for the most part, on paper. At the same time the air was full of reports regarding remarkable cases of speed and acceleration. These accounts referred to the attainment of a rate of 65 miles an hour in 1,700 ft., but when they were run to earth they were found to be based very largely simply on an estimate both of velocity and distance.

A trial was, however, made a few months ago by the General Electric Co. at Schenectady, N. Y., in which results were obtained that are so far ahead of anything published heretofore that I have prepared a diagram showing the comparative rates of acceleration of these Schenectady experiments and those obtained by me and published on March 19 and 20. The Schenectady data was given in the speeds obtained in seconds of time, whereas the diagrams of the previous experiments gave the speeds obtained in the distance run. For purposes of comparison it was necessary to reduce them to a common basis and this has been done in the diagram presented herewith, where the abscissus represent the speed in miles per hour, and the ordinates the elapsed time in seconds.

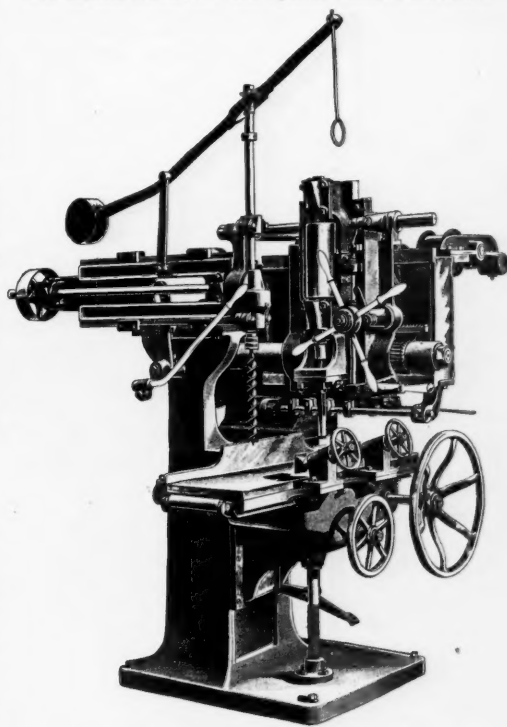
The curves show the acceleration as follows:

- 1 = General Electric car at Schenectady.
- 2 = Hardie air motor car, New York.
- 3 = Local train, Central Railroad of New Jersey.
- 4 = Manhattan Elevated Railroad.
- 5 = Coney Island electric car.
- 6 = Royal Blue Line, Philadelphia to New York.

The diagram of the acceleration of the cable car has been omitted on account of the low maximum speed attained and the fact that that speed may be attained with a jerk.

The remarkable superiority of the Schenectady car over all competitors is to be seen at a glance, but the shape of the curve is such as to lead one to the conclusion that 40 miles an hour would be the upper limit of its capacity, if, indeed, it could have reached even that speed under ordinary working conditions. But, even as it stands, the record is a remarkable one. Thirty-six miles an hour was reached (when reduced to a level track basis) by only two other motors, and these were the locomotives hauling the trains upon the Central Railroad of New Jersey and the Royal Blue Line from Philadelphia to New York. The electric car attained this speed in about  $16\frac{1}{4}$  seconds; the Royal Blue Line needed  $75\frac{1}{2}$ , and the Central Railroad of New Jersey  $80\frac{1}{2}$ ; a difference of nearly 5 to 1 in the elapsed time.

The Hardie motor, for the speeds which it did reach,



New Chisel Mortising Machine—Built by the Atlantic Works, Philadelphia.

made a good record, reaching 20 miles an hour in  $16\frac{1}{2}$  seconds as against 40 seconds for the ordinary electric car.

The question, however, is really one of power, for given a power equal to the weight plus the internal resistances of the machinery, the acceleration will be the same as that of a falling body, and the nearer this condition of affairs is approached the more rapid the acceleration. In this diagram before us it is evident that the Schenectady motor had more power per pound of weight than any of the others, and it is equally apparent that had the trains of the Manhattan Elevated, the Central of New Jersey or the Royal Blue Line been lighter the acceleration would have been more rapid. The falling off

\* Discussion of Mr. J. A. Carney, Master Mechanic, Chicago, Burlington & Quincy R. R., at the December meeting of the St. Louis Railway Club.



in the rate of acceleration at the higher speeds is due to an increased resistance to be overcome and an actual loss of drawbar pull, else the acceleration curve would be a straight line.

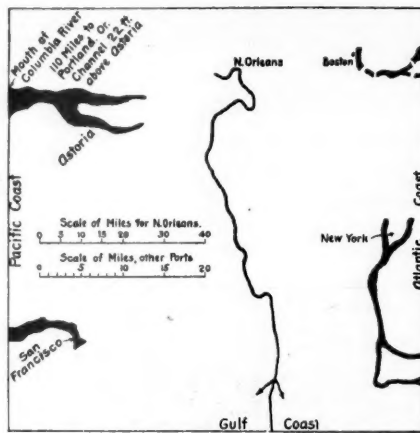
The locomotive hauling the fast express showed a capability of hauling its train at a speed of 60 miles an hour on a level track, whereas, as already stated above, it is fair to infer from the shape of curve No. 1 that 40 miles an hour would be an upper limit of the unloaded electric motor, while from the performances of locomotives similar to those tested, a speed of 90 miles an hour with a light train is probably within their capacity. The limit of speed of the Manhattan Elevated engines with a five-car train on a level track is probably no more than 33 1/2 miles per hour.

The speed attained by the Hardie motor car was too low to form an accurate estimate of its upper limit of speed, but if we may judge of the probable form of its curve from the others, it appears that about 28 miles an hour would be that limit.

Inasmuch, then, as acceleration is a matter of power and internal resistance, a comparison of the performances of any two motors must simply resolve itself into the assertion that one had more or less power than the other per pound of weight moved and internal resistance overcome, the latter being a variable quantity. The results thus far obtained seem to show (1) that for low speeds and light loads the electric car can be, and, in fact, is made more powerful than the locomotive per pound of average load, but that for high speeds the locomotive, thus far, holds the palm; (2) that in actual practice, it is probable the average locomotive exerts a

portance to increasing draft, is operating more strongly each year against inland ports.

This change is the growing demand for a decrease of time in ocean voyages for freight as well as passengers. The ocean transportation lines are growing stronger, and are demanding it. The rapid methods of busi-



Area of 30 ft. Channel at Seaports of the United States.

ness and sales of the present day are demanding such reduction. The railroads, which formerly resisted the demand in order to shorten their hauls, are now acceding to it and making such concession, namely, delivery at coast line, a card in their competition for business. An additional run of 100 miles, more or less, in order to reach a port directly at the coast, is not so serious for the railroads as it was in the days of higher rates and higher cost of railroad transportation. But to the ocean vessels a run of 100 miles or more inland has grown more serious every year. It will soon be a thing of the past, except when, in years of unusual and unexpected abundance, tramp steamers of light draft may come to inland ports and secure freights that the overtaxed coast ports cannot take care of. Just as transportation on the Erie Canal is dying a natural death from inability to increase cargoes and decrease time, so our inland ports are likely, except in unusual years, to find their transoceanic freights lessen. Just at present the lack of satisfactory terminals and docks at our coast line ports is holding back this change. The railroads of the Atlantic Slope are doing effective main line work in economy of transportation, and when they are furnished proper aid in terminals, docks and channels at New York and Boston, probably almost the entire bulk of transatlantic commerce will be handled at these ports for our Northern states.

On the Pacific Slope the harbor entrances for coast line ports are more satisfactory. Until this year there has been no line of railroad extending to any deep-water port at the coast line north of San Francisco. The ocean carriers have until lately given less attention to the economies of their business than has been the case on the Atlantic, but the inland journey is becoming a heavier percentage of cost on the short voyage of to-day. With a much shorter voyage via Panama or Nicaragua Canal, the relative disadvantage in time and money of a long run inland will be greater, and the demand for good ports directly on the coast line will increase.

The Pacific coast railroads have been somewhat indifferent to economies of profile until lately, but the Northern Pacific, Great Northern, and Canadian Pacific roads have now secured profiles vastly better for operating cost than the San Francisco roads.\* The recent throwing open of the Oregon Railroad & Navigation Company's line to all connections from the East secures by its low grade route westward from Spokane, for both the Northern Pacific and the Great Northern, the greatest possible economy of profile that can be secured across the western part of our country. Terminal facilities, the connecting link between good railroads and good harbors, are greatly lacking on the Pacific coast.

#### American Society of Civil Engineers.

The programme of the annual meeting of the American Society of Civil Engineers appeared at length in our last issue. We can report now only the proceedings of the first session, namely, up to noon of Wednesday.

The Society met in its beautiful house at 10 a. m., the President, Major Harrod, being in the chair, and with a large attendance. The reports of the Board of Direction, Secretary, Treasurer and Finance Committee were read and accepted. The total membership is now 2,073, the net increase during the year having been 58. The new house has been secured and furnished and everything set in running order, and it is now believed that the permanent loan will not be more than \$90,000, and the income above running expenses will easily provide for the interest.

The Norman medal was awarded to Mr. Julius Bair Associate Member of the Society, for his paper on "Wind Pressures in the St. Louis Tornado." The Rowland prize was awarded to Mr. Arthur L. Adams, member of

\* For comparative profiles on a fairly large scale see the *Railroad Gazette* June 30, 1893, page 476.

the Society, for his paper on the "Astoria Water Works." The Collingwood prize for juniors was not awarded.

It was announced that a number of sheets of the History of the Society, prepared last year by the Secretary, remain unbound; that there is a profit of nearly \$1,000 on the sales of the History so far, and it was expressed as the sense of the meeting that it would be well for the Directors to arrange to have the sheets now printed bound in a cheaper form than heretofore and sold at a lower price.

A resolution was offered and carried as follows: "That a committee be appointed to consider the subject of rail joints for standard steam railroads and to report to the Society certain types of joint for consideration and discussion, and that this matter be referred to the Board of Directors under the provisions of the constitution."

A resolution was offered referring to the Board of Direction the subject of having a similar engineering committee appointed to report to the society on paints and tests thereof.

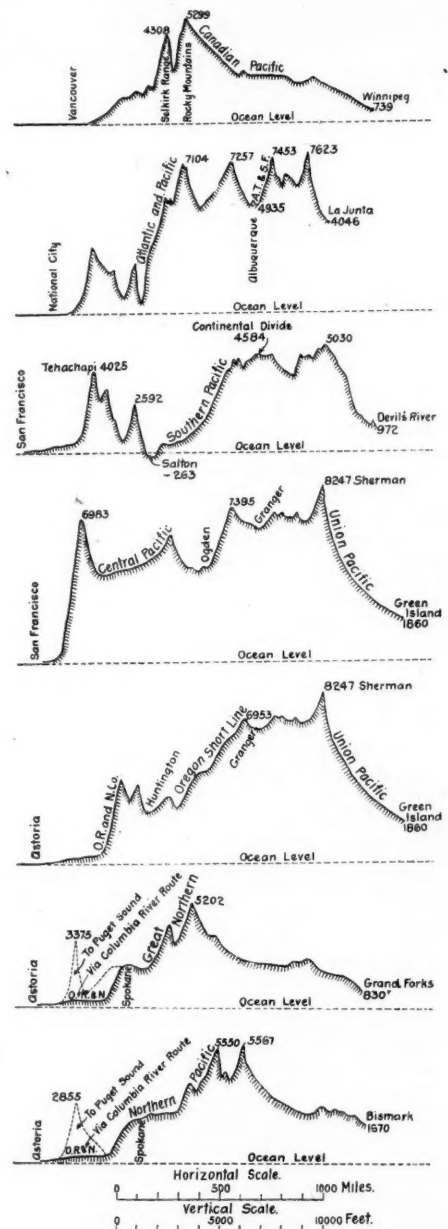
Considerable discussion was had over an effort to discontinue the use of the 24-hour system of time notation in the official documents and publications of the society, which resolution was lost.

The tellers reported the election of the following officers:

President, Alphonse Fteley; Vice-Presidents: Edward P. North and Frederic P. Stearns.

Treasurer, John Thomson.

Directors: S. L. F. Deyo, John Kennedy, Henry Man-

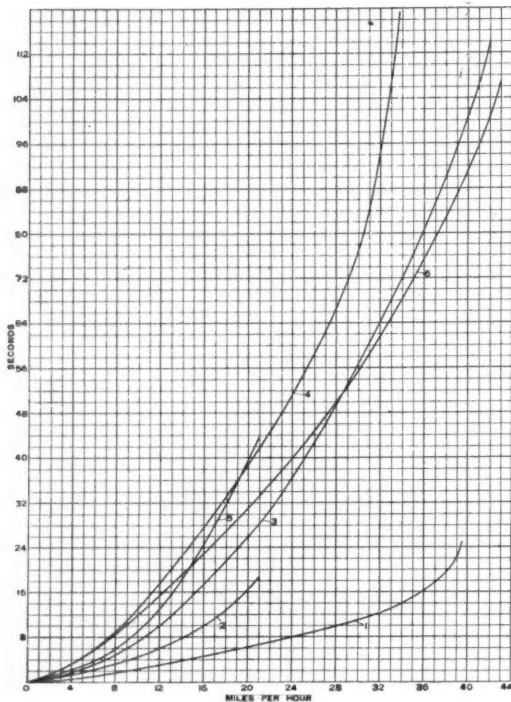


Profiles of Railroads Leading to the Pacific Coast.

ley, Charles C. Schneider, John J. McVean and George Y. Wisner.

#### Foreign Railroad Note.

The governments concerned have recently made arrangements by which the custom-house inspection of baggage on the limited express trains running between Calais and Rome and between Berlin and Verona will be made on the trains. This is probably the first time this has ever been done in Europe, the ordinary construction of cars there making it very difficult. These limited trains are formed of cars constructed much like ours.



Comparative Rates of Acceleration from Recent Tests

greater tractive pull per pound of weight moved than the electric car at speeds above 15 miles per hour, while at speeds below twelve miles per hour the electric motor is the superior, and finally (3) that the limit of speed possible with motors thus far placed in actual service is below that of the locomotive.

These conclusions are not based upon any theoretical or mathematical deductions whatever, but merely upon the actual performances of electric and steam motors in service. The problem of building a motor capable of hauling a heavy train at high speeds is a difficult one, and whether it is a locomotive or an electric motor it is not one to be lightly undertaken by a novice. To build a motor, electric or steam, that will propel itself at a speed of 60 miles an hour, may be comparatively easy, but to construct one that will haul a 300-ton train at the same speed is an entirely different matter, even though it is nothing more than the supplying of additional power.

#### Our Future Seaports.

BY ARCHIBALD A. SCHENCK.

The *Railroad Gazette* recently made a brief allusion to the increasing draft of ocean vessels, and the consequent need of deeper and less circuitous harbor entrances. Anything under a depth of 30 ft. may now be considered inadmissible for a port of the first-class, and no port having less than that depth of channel can in the future be considered as "in the race." A small diagram is submitted showing the width, length and direction of channels of 30 ft. depth of high water of neap tides at important ports of the United States. It will be noted that the 30-ft. channel into Boston harbor is lacking in depth at several points. The lower channels at New York are both narrow, and one channel is too indirect. Except in the case of New Orleans, the channels to inland ports are not shown on the diagram. This is not merely because, with one exception, our inland ports lack a 30-foot channel, but because a change, almost equal in im-



### Ignorance and Railroad Invention.

When the genius of the inventor is untempered by knowledge he may go to great lengths, and it is not to be expected that an art as important as the equipment of railroads is without examples of misguided invention. We published last March some of the efforts of active-minded farmers and milliners to design couplers. We give now a few of their studies in the general field, all taken from actual patents on record in Washington.

Perhaps the schemes for preventing collisions are among the best examples. In Fig. 1 a device is shown by which a truck is made to run some distance ahead of the locomotive. By electrical connections it will apply the brakes and reverse the engine. A series of telescopic tubes is fastened to the front of the locomotive frame and is attached at its forward end to a truck. This series is extended by compressed air and held in position by a series of spring catches operated by a cord running to the cab. Springs coiled on the outside of the tubes force them into each other when the catches are released. There is a headlight on the truck, and

propelled ahead of the locomotive by a bar which has a notch in its forward end to engage with a pin on a shaft mounted in the rear end of the anti-collision device. This shaft has a rope wound around it so as to hold the pin on the shaft from turning, the other end of this rope being wound on a drum on the central shaft. Thus at the same time that the cables are slackened and the device lowered to the track the pin on the rear shaft is allowed to turn out of the way of the push bar so that the locomotive can run up the incline and thus be brought to a standstill.

An invention operating on the same principle as that last described is shown in Fig. 3, but in this case provision is made for stopping the opposing train. This contrivance dates back to 1865. It consists of two frames like simple roof trusses supported on wheels. The inclined members of the frames are provided with rails that curve slightly to meet the track.

The most audacious scheme for preventing collisions is illustrated in Fig. 4. This plan contemplates running one train over the top of the other. To accomplish this the cars at both ends of each train are inclined on top. A railroad track runs from the level of the main track

press messengers now enter the turrets and fire through the loopholes. The boom can be turned on its pivot by a circular rack and pinion operated from within one of the turrets, thus enabling the express messengers to get a raking fire down the side of the train.

In 1838, when 20 miles an hour was a good speed, an arrangement was devised by which a speed of 100 miles an hour was to be secured. The scheme is illustrated in Fig. 7, and confidentially we may say that this is the original Holman "speeding truck" now under a locomotive on the South Jersey Railroad, stock in which the dear public has lately been allowed to buy. Carried on wheels which run on the ordinary track is a second track several miles long. This second track was to be drawn by locomotives at a speed of 20 miles an hour. On the second track is a shorter third track, also supported by wheels and drawn on the second track at 20 miles an hour, giving it an absolute velocity of 40 miles an hour. Above this were third, fourth and fifth tracks, each of which was similarly supported, and above all was the train. In this manner, by giving each track a speed of 20 miles an hour on the track below, the train was to reach 100 miles an hour.

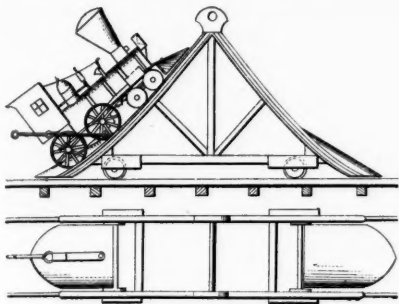


Fig. 3.

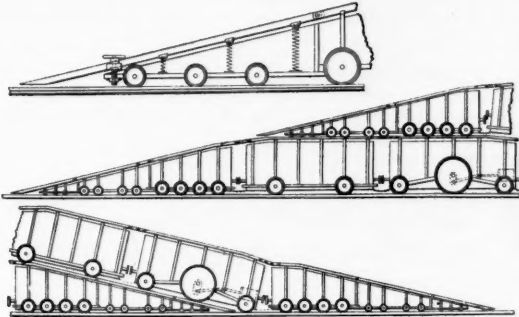


Fig. 4.

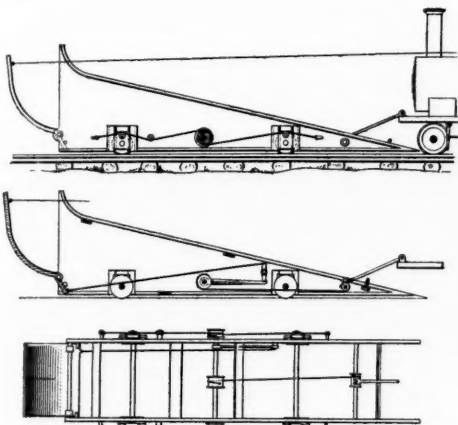


Fig. 2.

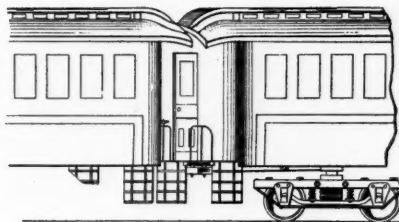
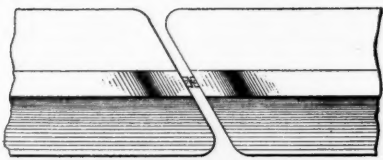


Fig. 5.

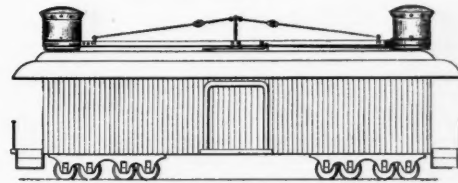
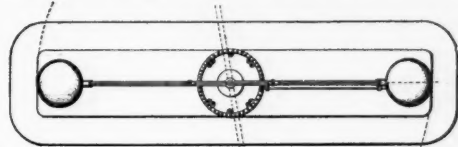


Fig. 6.

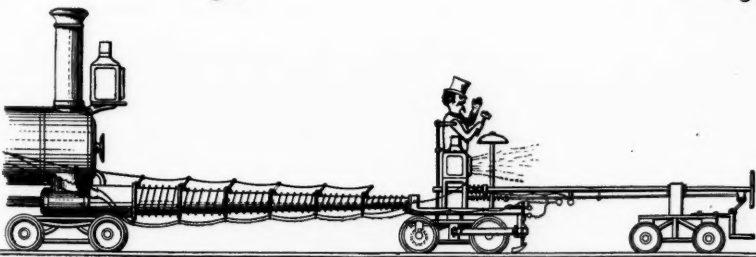


Fig. 1.

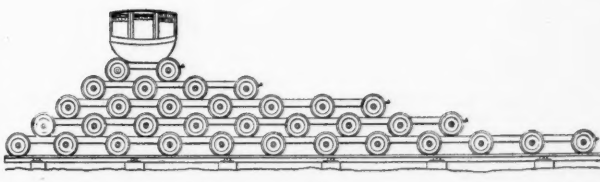


Fig. 7.

Some of the Achievements of our Countrymen in the Field of Railroad Invention.

above this a figure of a man, whose arms are operated from one of the truck axles so as to strike the bell in front of him. A suitable device is provided to make an electric circuit when the pilot strikes an obstruction, and the train is stopped by mechanism in the cab operated by electricity over the circuit thus completed. Provision is also made for stopping the train in case either truck leaves the track.

In case, however, the collision does take place something must be done to prevent mischief. In Fig. 2 is shown a structure intended to be attached in front of the locomotive, the general form being that of a wedge up which the engine is to run. The device consists of two wedge-shaped sides having their upper edges formed into a track for the locomotive wheels. These sides are carried on axles and wheels. The central shaft has a pulley on each end. Cables are secured near the ends of the sides whence they pass over rolls on the journal blocks in such a way as to raise the structure on the supporting wheels. An arm secured to the central axle has its end held by a latch from which a cord runs to the lower end of a lever pivoted to the front of the structure which projects forward in position to be struck by another train or other obstruction. In this manner, when a collision occurs the lever in front is struck and releases the pivoted latch, which allows the central shaft to turn and slacken the cables, thus lowering the structure upon the tracks. The device is

up these inclined cars and along the top of the train to the other end where it passes down to the main track again. The track on the train is provided with siding and hinged joints to allow for motion between the cars. The end rails of the train track are vertically adjustable by screws. This scheme is intended not only to prevent collisions, but to enable trains to pass each other on single track roads and to enable a special to pass over slower trains running in the same direction.

An anti-telescoping car is the subject of Fig. 5. The ends of this car are built at an oblique angle, and the cars are coupled by pins and S shaped links, so that as the cars leave the track the pins escape from the open hooks on the ends of the links.

The many successful train robberies of late years have directed attention to burglar-proof cars; of which an example is shown in Fig. 6. A boom which carries at each end a turret of steel is pivoted on the center of the car roof. The turrets are made of an upper and a lower section, which telescope. When the boom is in line with the car the turrets are directly above openings. Chains which are fastened near the bottom of the upper section of the turret, after passing over pulleys on the upper edge of the lower section, pass through an opening closed by a sliding door in the turret bottom and support a ladder in the car. By pulling on the ladder the upper section of the turret is raised and retained in that position by spring catches. The ex-

Besides the dock work now under way by ore-handling roads enough track construction is being done and enough equipment is being added to make \$900,000 additional expenditure. This includes about 1,400 ore cars of the largest size, contracts for some of which have not yet been let.

Several mines on the eastern lake ranges are shipping ore by rail to Chicago this winter, and the business is expected to grow.

### A Record in Chimney Construction.

The round brick stack of the power house of the Union Depot Railroad Company, St. Louis, which is 162 ft high with an internal clear diameter of 8 ft., was built in 1890 in 43 actual working days. All but the lower 39 ft. of this stack was thrown down during a tornado on May 27, 1896, and it became necessary to replace the stack in the shortest time possible. Charles Rollinson & Co., contractors, rebuilt the stack from the existing stub and finished the brick work in 11 working days and 1 hour, during the majority of which time nine men worked. Allowing for time lost on account of bad weather and when only eight men worked makes the total actual working time equivalent to 120½ hours for nine men. On an average these men laid in place 15,000 bricks a day, so that each man handled 139 bricks per hour, or 2½ bricks per minute. The fires were started under the boilers after the stack had reached a height of about 90 ft., so that for the last seven days the smoke interfered with the men, who had to work from a frail narrow scaffold. The reconstructed stack has now been in continuous service for a period of over 18 months, and has withstood several severe wind storms. These particulars are from a paper by Col. E. D. Meier in *Cassier's Magazine* for January.





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#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The rapid transit situation in New York City has reached a remarkably interesting stage—so little is known and so much can be imagined. The visible situation is that the Mayor has indicated pretty plainly that an underground project will not be favored by this administration and that the Manhattan Company will have at least a clear field; the President of the Manhattan has said and intimated that his company is prepared to put on electric traction and do other things; the Metropolitan Street Railway Company (the great surface company) has withdrawn in favor of the Manhattan; the Commissioners are ready to entertain the propositions of the Manhattan. All this is visible on the surface. What is below we can only conjecture. It is obvious that the burden is now on the Manhattan to prove its good faith. The way is clear, and the city waits to see if the Manhattan people really intend to improve their equipment, tracks and service at a cost of perhaps \$10,000,000; or if they are only playing the old game of promising effectual changes on impossible conditions. We venture no opinion; but the opportunity is now before the Manhattan Company to prove that it can provide the needed transportation facilities and is ready to do so on terms that the Commissioners and the city have the power to give. One of the most interesting developments of the last few days is the story that the Walker Company has taken the contract to supply the electrical equipment for the system. We cannot get confirmation of this, which is pretty good evidence that the contract has not been signed. On the other hand there are several plausible reasons to believe that such a contract will be made; among others the names of the new owners of the Walker Company and the date of the change of ownership. Those are full of suggestion as related to the last city election. But the Westinghouse Company does not yet consider that it is out of the competition, and probably the General Electric is also still in.

The Railroad Commissioners of New York ask the Legislature to pass 16 amendments to the laws of this state. This looks like a long list; but, with the exception of the propositions to "summarily compel" interlocking signals at street crossings which are used by electric cars, and to require gas or electric lights on all passenger cars, all appear to be commendable. Most of the proposed amendments simply correct obvious deficiencies in existing statutes. The two we have specified are commendable in spirit and we criticize only the apparent lack of the necessary provisos to cover exceptional cases. But with these, as well as all the others, the main concern of the Commissioners, as of everybody else, must be as to whether they are likely to receive rational consideration from a legislature of the kind that we usually find at Albany. If a law is passed requiring the posting of time tables it is to be hoped that it will require them to appear a certain length of time before they are to go into effect. Superintendents often delay publication until the last moment, and even until some hours or days after

a change has actually been made, to the inconvenience of many passengers. Timetables published regularly in newspapers need more intelligent care. For the old table to appear Saturday with no mention of a change that has been ordered for the following Monday is a clumsy disregard not only of the convenience of passengers, but of the interest of the road. The principal recommendation of the Commissioners, that for a \$250,000 crossing appropriation, should be promptly taken up. The experience of Massachusetts in this matter during the past seven years appears to be entirely satisfactory, and as New York has already, by the law of 1897, approved the principle of state taxation for defraying a portion of the cost of improvements of this kind, it is only ordinary fairness to increase the appropriation from \$100,000 to \$250,000. The smaller sum would have to be spread out so thin as to be almost invisible in so large a territory. As we showed last year, it would require a similar appropriation every year for 400 years to abolish all of the crossings in the state. Even the quarter-million now proposed is only about one-eighth as much per crossing as Massachusetts appropriates annually, and at \$5,000 for each crossing (one-fourth of a total estimated cost of \$20,000) it will do away with only 50 crossings a year. As there are 8,636 crossings in the state, we should thus be 173 years in finishing the job.

#### A Standard Rail Joint.

At the last convention of the American Roadmasters' Association a resolution was passed, the purpose of which was to try to get the American Society of Civil Engineers to take up the rail joint question and settle it as the Society has settled the rail section for years to come.

At the annual meeting of the American Society of Civil Engineers on Wednesday a resolution was introduced, the purpose of which was to procure the appointment of a committee of that Society to consider the subject of the rail joint and to report to the Society certain types of joint, for consideration and discussion. The appointment of a special engineering committee in the Society is a little complicated, and it can hardly be brought about in less than eight months time from now. The Board of Management may disapprove of it, or the Society in general business session at the summer convention may disapprove of it, or finally it may fail when it goes to letter ballot after that convention. We judge, however, that there will be no difficulty in these various steps and that the committee will finally be appointed. The work of the committee would necessarily be tedious, and if it should reach a final report in time for the annual meeting a year from now it would do very well indeed.

The work will be not only difficult, but in some ways delicate. The committee will have at once to face a complication which the Rail Committee did not meet, namely, the question of patents. The patents on rail joints are probably not as numerous as those on car couplers, but they must cover pretty nearly everything that can be patented, and there are two or three patented joints which may cover points which the committee would conclude should be embodied in the final joint. Therefore, it seems very likely that the upshot would be to do something like what the Master Car Builders' Association did in the coupler matter—select a type to which inventors and patentees could work.

It is not necessary to point out the importance of an investigation such as this committee could make. There are few details connected with railroads in so confused and unsettled a condition as the matter of the rail joint, and a committee going at that matter with the authority of the American Society of Civil Engineers behind it could collect a mass of knowledge such as nobody else could collect; and even if the final conclusion should be adverse to recommending any type, the mere fact of accumulating and making available that body of knowledge would be sufficient justification for the committee.

#### Some Notes on Mixed Trains.

The experimental mixed train on the Pittsburgh, Fort Wayne & Chicago, of which we gave a brief account on Dec. 10 has been taken off, apparently for the reason that the demand for that kind of a train did not prove so great as had been hoped for. This train, it will be remembered, was a freight train which, in order to accommodate passengers, not only limited its load but also the length of its stops at stations; but it did "peddling."

From a number of letters which we have received from railroad officers who read our note, it appears that the first query arising in the mind of a superin-

tendent was, Why did not the Fort Wayne load this train with full carloads instead of trying to do a miscellaneous package business at every station? To try to accommodate passengers and package freight by the same train seems to be to attempt the impossible task of making the same stop both short and long. This was a very natural query, for both ancient and modern [railroad] history tell us, everywhere, that the simplest plan for accommodating the travel, where a passenger train does not pay, is to attach a car for passengers to a through freight train that makes the fewest possible freight stops.

It will not do, however, to hastily judge the Fort Wayne on this ground, for long stops may in some cases be a help instead of an obstacle to passenger traffic. On the Chicago, Milwaukee & St. Paul there is a freight train, running between Oxford Junction and Calmar, Ia., on which the passenger earnings are larger than they are on the regular passenger train over that line, and its station stops are not short. This is not because the passenger train runs at inconvenient hours; it is due to the fact that traveling salesmen and others having business at two or more towns along the line take advantage of the time while the train is doing its work to call on merchants near the station, and thus save a large number of stopovers. On another part of the same company's line (between Marion and Farley) there is a mixed train which accommodates drummers in the same way. They visit the merchants during the time that the train stops at the station and thus cover many towns in a single day. The Milwaukee road also has mixed trains which are run largely for the purpose of accommodating livestock traffic. A passenger train between Davenport and Monticello became so unprofitable that it seemed to be necessary to take it off, but by utilizing it for the transportation of live stock to Oxford Junction, the place where the stock takes the main line for Chicago, the company was able to keep the train running. In this case, of course, it was desirable that the four-legged passengers, as well as those in the varnished cars, should reach their destinations as soon as possible, so that all interests concurred in making the stops short.

The speed of mixed trains has in the past been a difficult question. To make good time including stops requires high speed on all level and descending grades; but with no continuous brake, high speed was always dangerous. A bell-cord on the tops of freight cars is not a satisfactory safety-appliance, and so it has generally been felt that to combine speed (even moderate), and safety, in a mixed train, was a doubtful task. But with the general introduction of the air-brake, so that not only the engineer but the conductor can always stop the train quickly, and of the M. C. B. coupler, reducing the shocks incident to starting, stopping and slackening, the running of mixed trains is now much less troublesome, and we conclude that some managers who have been strongly opposed to them have lately modified their opposition materially. Certainly it is not now difficult to get air-brake cars for every mixed train; and if a train is to do package business exclusively, it can use the same cars all the time. A train run to accommodate live stock would have to take whatever cars the stock was loaded in; but stock cars should be among the first to be equipped with air-brakes on every road.

Questions of safety and facility of operation are not the only ones connected with running mixed trains. In meeting the demands of the traveling public on a line through a thinly settled country, railroad managers find not only that the income of trains is insufficient to pay their expenses, but often the situation is a great deal worse than that; the income of a train is so small as to be ridiculous. At the same time, to the few passengers who do wish to travel, the question of transportation is of vital importance. This is especially the case on lines where the general business prosperity has for any reason declined from the standard of past years, or where new competitors have entered the field. The road being in existence and being for some of the passengers the only means of communication, perhaps to and from the county seat, it is important that the public shall get all reasonable benefit out of its iron highway. In this connection a Western manager, commenting on the Fort Wayne experiment and the problem of satisfying the passenger travel in a thinly settled country, says: "Three cents a mile for short passenger trips is altogether too low. Passenger rates should be based on the same principle as freight rates; very much higher per mile for short distances than for long. For one, two or three miles, even 10 cents a mile would not be too high; as distances increase the rate could be lowered, and for, say, 300 miles, two cents a mile would be reasonable, even in the Western states."



The name of a train, and its reputation, which may sometimes depend on the name, constitute an element not to be forgotten. Where a passenger train has been run for many years and has become a fixture, any proposal to change it to a freight, or even to a mixed train, at once arouses the opposition of the public. The superintendent who finds that he must do something to increase the earnings of such a passenger train had better put on his freight cars without making much noise about the matter, if he can. On the other hand, if a certain division or district needs more passenger facilities it may be better to tell the public that you will carry them on the cabooses of a freight train than to try to give the train the dignity of the new title of "mixed train"; the passengers will not expect so much, while at the same time the train can be kept just as punctual to time and the public just as well served, as though the change were more loudly heralded. On many of the roads in the more thickly settled states, and on almost any road which pays good dividends, the mere name "mixed train" will, of course, at once arouse criticism, if not derision; and yet, where freight trains are equipped with air brakes so as to be stopped quickly, and with M. C. B. couplers so that quick stops will not throw passengers off their feet, and where freedom from rear collisions is insured by telegraphic space intervals, passengers can undoubtedly be carried in cabooses with a high degree of safety. And with freight trains running, a manager receiving a demand for new passenger trains where the cost would be excessive as compared with the income, may very reasonably ask the public to compromise on a slow train; but he will have to be cautious in administering a dose which will be looked upon as so bitter, unless he takes care to have it well sugared.

#### The New Russian Grain Rates.

The rate at which grain is carried in Russia is a matter of very considerable importance to a good many farmers and carriers in this country, and of vital importance to many Russian farmers. They have long suffered from low prices, and, as in this country, the market and the farmer are often so far apart that the necessary cost of carriage becomes a great element in the farm price. After discussion and study actually extending over years the government has found it practicable to establish a new grain tariff.

We have heretofore given an account of the tariff introduced in 1893, the chief feature of which was a rapid decrease in rates per mile with increases in distances carried, and we have also mentioned the recent discussions of different interests with a view to modifying, if desirable, these rates, and on the basis of the experience with them adopting a tariff which may be expected to be permanent enough to serve as a basis for the future conduct of producers. The government, near the end of September, announced its decision and the new tariff, which was to take effect Nov. 1, Russian style, which is our Nov. 13.

In the new schedule the general system of differential rates, decreasing with the distance, as introduced in 1893, is preserved. Not much change is made in rates on grain exported; a reduction was considered not only as useless, but in some degree injurious, especially to the interests which it was desired to protect. The differentials on inland shipments, however, were modified so that for the shorter distances, less than 316 miles, rates are reduced, and for greater ones, 532 to 745 miles, they are increased. (The old rates decreased very greatly for the greater distances.) The proposal to make rates on flour and grain different is not accepted, nor is any difference made between wheat and rye and the coarser, cheaper grains, but on by-products of flour and oil mills (bran and oil-cake) rates are reduced to about 0.7 cent per ton per mile for distances of 700 miles or less; for greater distances remaining as before, 10 per cent. less than the grain rate. No change is made on flaxseed and other oil seeds for export; they pay for 166 miles or more \$7.20 more than grain per carload of 27,000 lbs.; for domestic consumption they pay the same as grain. Terminal charges are reduced from 0.7 kopek to 0.5 kopek per pood, and weighing charges from 0.25 to 0.20 kopek per pood; per carload of 27,000 lbs. these are reductions from \$2.63 to \$1.88 for the terminal and from 94 to 75 cents for weighing, the two together (if only one terminal is charged) amounting now to 19½ cents per ton of 2,000 lbs.

Thus the principle of the tariff of 1893 is maintained, and it may be considered as the permanent policy of Russia to make rates for great distances extremely low, as they must be if the eastern parts of European Russia, not to say Siberia, are to be able to market their grain. The complaint of the central parts of the country that they were being deprived of their natural markets, the towns in their own vicinity, by the very low rates from distant districts where the soil is fertile and very cheap, have been recognized, not by raising the long-distance rates, but by lowering those for shorter distances on grain for home consumption. For distances of less than 360 miles the export rate is higher than the domestic rate.

For exports the following rates are made by the new

tariff, for carloads of 750 poods (27,000 lbs.); for 180 versts (120 miles) or less, 30 kopeks per verst = 22½ cents per mile.

For greater distances up to 320 versts (213 miles), add to the 54 rubles (\$27) for 180 versts, 12 kopeks per car per verst = 9 cents per mile.

For greater distances up to 800 versts (532 miles), add to the \$35.40 for 320 versts 11 kopeks per carload per verst = 8½ cents per mile.

For greater distances up to 1,120 versts (745 miles), add to the \$61.80 for 800 versts 9 kopeks per carload per verst = 6½ cents per mile.

For all distances greater than 1,120 versts, add to the \$76.20 charged for that distance 6½ kopeks per carload per verst = 4½ cents per mile.

At these rates a carload of 27,000 lbs. from Chicago to New York would cost: \$76.20 for 745 miles + \$10.48 for the additional 215 miles + \$1.88 for terminal (if it is charged only at one terminus and 75 cents for weighing = \$89.31 in all, which is 33.08 cents per 100 lbs., and therefore more than one-half more than our railroads are usually able to get, and twice as much as they get on a large part of the shipments.

But this does not fairly represent the effect of the Russian rates; for the greater part of the grain shipped from Chicago is produced far from that city, and the railroad rates west of it are much higher than east of it. From Omaha, for instance, 1,455 miles from New York, the charge by the Russian export tariff would be only \$24.28 per carload of 27,000 lbs. more than from Chicago, and would amount to 42 cents per 100 lbs.; from Jamestown, N. Dak., it would be \$126.28 per carload of 27,000 lbs. to New York = 46.8 cents per 100 lbs. To those who look for the deluging of Europe with wheat from the Siberian Railroad, we may add that this extraordinarily low rate for great distances would amount to 68 cents per 100 lbs. for wheat shipped from Spokane to New York, 2,882 miles. The additions for the greater distances are at the rate of 0.36 cent per ton per mile, which gives 18 cents per 100 lbs. for every additional 1,000 miles.

As in this country most of the grain goes to an interior market before it is shipped to the seaboard, it will be interesting to apply the Russian tariff to some such American shipments, designed for export. Shipments from places 200 miles from Kansas City would cost at the rate of 13.6 cents per 100 lbs. to Kansas City; from Kansas City to Chicago, 22 cents; from Chicago to New York, 33. From the points 200 miles beyond Kansas City the through rate would be 27½ cents per 100 lbs. to Chicago and 45 cents to New York. Now the sum of the rates to Kansas City and from Kansas City to Chicago would be 35.6 cents, or 29 per cent. more than the direct rate, and the sum of rates to Kansas City, from Kansas City to Chicago and from Chicago to New York, would be 67 cents, against the through rate of 45 cents. That is, the great interior markets would be abolished practically, unless there was some provision for "storage in transit," like our milling in transit, and storage in transit was at one time proposed and we believe adopted in Russia, perhaps temporarily, to provide for a pressure of grain for which there was storage at comparatively few stations.

On grain for home consumption the new Russian rates per carload of 27,000 lbs. are:

200 versts (133 miles) or less, 22 kopeks per carload per verst = 16½ cents per mile.

Greater distances up to 540 versts (360 miles), 15 kopeks per verst = 11½ cents per mile.

For all greater distances the domestic rates are the same as the export rates above.

Thus a shipment of grain to St. Petersburg or Odessa over a distance of 183 miles will cost \$28.20 (plus terminals) if exported and \$22 if consumed in Russia. There must be some difficulty in ascertaining whether the grain is exported or not, but outside of these places the exporting cities are not large towns, and the rate was reduced chiefly for the benefit of grain producers in the central districts, to protect them against those far distant. The very low rates for long distances are made to enable these latter to export their grain, not to enable them to compete with the older producers of Central Russia. This is like a provision to protect the grain-growers of Ohio and Pennsylvania against those of Nebraska and the Dakotas.

A comparison of the new Russian rates with the old ones is complicated by the fact that in the old tariff the rates were per carload of 21,960 lbs., while in the new one the carload is 27,000 lbs., or about 23 per cent. more. The old export tariff made but three rates per verst—for the first 180 versts, for the 800 following, and for all additional distances; the new tariff, as shown above, makes five rates per verst; but application of them to many different distances shows that the difference in the actual charges is insignificant; and the chief innovation is in domestic rates between 213 and 360 miles.

It may be thought that we have paid more attention to these Russian grain rates than they deserve. Actually, however, there are no railroad rates in the world out of North America which affect our railroads so directly. Russia is the only country in the world, except a small part of India, in which grain is carried for export over what we would call long rail routes. Its railroad system is undeveloped, but is now growing, and apparently the country will be able to increase its production materially if it can find a market for its grain at remunerative prices. The grain-growers, however, have had serious losses at the prices current of late years, and the tariff of 1893 was devised after careful study of the conditions governing production for ex-

port, not only in Russia but in the other chief exporting countries. There has been time enough to test this tariff, and the establishment of it as a declared permanent policy (for we see that the export rates are substantially unchanged in the 1897 tariff) shows us what we have to depend upon. Russian export rates are not to be higher, but they are also not to be lower than they have been since 1893.

In our issue of Dec. 31 we noted in detail the opening of the bids for the eight-track movable bridge over the Chicago Drainage Canal near Campbell avenue. At a meeting of the Trustees of the Sanitary District, Jan. 11, the contract for the superstructure of this bridge was awarded to the King Bridge Company, of Cleveland, and that for the substructure to the Lydon & Drews Company, Chicago. While it would naturally be supposed that this would settle this matter, in which a great deal of interest has been taken, yet the final contract for the work cannot be closed until the three railroads interested have approved the plans of this swing bridge designed by the Sanitary District engineers. We are informed that so far one road only has approved the plans, and also on fairly good authority we learn that the engineers of both the Chicago & Northern Pacific and the Pittsburgh, Cincinnati, Chicago & St. Louis railroads prefer a bridge made up of more than one unit, and are opposed to the swing bridge design where all the tracks are carried on a single movable structure. The objections urged against the swing bridge are certainly important from the standpoint of the railroads, and some of these objections were mentioned in our issue of July 2 last. According to the agreement between the railroads and the Sanitary District a bridge must be built which meets with the approval of the railroads, and, further, the cost must be borne by the Sanitary District; it therefore follows that the Sanitary District is anxious to build the cheapest bridge possible without reference to the inconvenience which an unsuitable bridge would afterward cause the railroads through delays to traffic. On the other hand, it would be poor business policy if, under the conditions of the agreement, the railroad should accept any but the most suitable design offered and should consider the question from merely the standpoint of first cost. What the outcome of this matter will be or what style of bridge will eventually be built at the eight-track crossing cannot be foretold now.

"Spring Travel to Alaska" has been a favorite news theme with the daily papers during the last few weeks. It has been said that the railroads were making great preparations to handle a largely increased tourist business, and that in some cases new cars were being bought. In December one of the Chicago daily papers called 100,000 "a very conservative estimate of the number of those who will make the trip to Alaska." We have inquired of the transcontinental roads west of Chicago, and of the Chicago roads connecting with them, and from six replies we gather that four roads expect a considerable increase of travel on this account the coming spring, but can make no estimate of what the business will amount to. One road adds that while thousands talk of making the trip, only a small percentage will actually start. One road has sent out 3,000 postal cards to ticket agents east and south of Chicago, but less than 10 per cent. of the replies show any business for Alaska in sight. This road predicts that not more than ten or fifteen thousand people will pass through Chicago for North Pacific coast points. The sixth road writes that while not able to give an approximate estimate of the number of people who expect to make the trip, the indications are that it will be very large, and that to meet the traffic this road has bought a number of tourist sleepers and day coaches and some new locomotives. The substance of all our reports but one is that the railroads which would be most directly affected have not found it necessary to make any unusual preparations to take care of extra business; and as regards the one road which has provided additional cars, there seems to have been ample reason for making such an increase of facilities even if the Klondike had never produced any excitement in the Eastern states.

The State Railroad Commissioners of Connecticut, in their annual report, speaking of the motor passenger car recently built by the New England road, say that "it would seem that the location of an engine in a compartment of a car used for the transportation of passengers might introduce an element of danger from steam and fire, in case of accident, that would equal or exceed the danger arising from the use of carstoves for heating purposes." Quite likely this view is right; but what weight should attach to the implied criticism? In the conditions which call for the use of motor cars most people would rather ride in a locomotive, sitting in the cab itself, crowded a trifle, perhaps, by the fireman, with his dirty hands and clothes, than go by horse conveyance or by bicycle or on foot. The function of a motor car is to carry passengers where a train cannot be made to pay, and where other conveyances are too slow and costly. It is largely a question of speed. There are hundreds of trains now running (those with no baggage car between the engine and the first passenger car) which, at the speed they run, probably involve the passengers in more risk of injury from fire than a steam motor car does when run at speeds suitable for its conditions. Perhaps it could be shown by statistics that for a given journey one would be safer on a car containing a hot stove than



he would be if he went afoot, specially if it were in the wilds of Connecticut. It is highly probable that such a car would be safer than ordinary wagon travel.

Judge Clifford, in the Cook County Circuit Court, at Chicago, has granted a new trial in the Ketcham case, holding that the charge of the judge to the jury in the trial court was erroneous. In granting a new trial Judge Clifford gives a very brief opinion, not more than a dozen lines, but he says that "the verdict would not stand for a moment in a higher court." This case, it will be remembered, is that in which a jury returned a verdict of \$21,666 against the Chicago & Northwestern for alleged blacklisting. It was reported in the *Railroad Gazette* of Dec. 31 and Jan. 7.

#### NEW PUBLICATIONS.

*High Masonry Dams.* By E. Sherman Gould, M. Am. Soc. C. E. New York: D. Van Nostrand Co. 1897. (Van Nostrand's Science Series, No. 22.) 16mo, pp. 88.

This little book is intended to replace the original No. 22 of Van Nostrand's Science Series, the theory of high masonry dams having been more fully elucidated since that book was issued. The subject is treated clearly and concisely. In the first part of the book sufficient theory is presented and formulae given to enable the method of treatment to be understood by an engineer. In the second part, the method of designing a high masonry dam is illustrated by a numerical example. The fact is pointed out that in a dam over 80 ft. high a section which is safe against crushing strains is also secure against sliding and overturning and, therefore, a computation of the resistance to crushing is all that is needed. For finding the correct distribution of the stress on the wide base of a polygonal section, the author suggests a modification of the formulae previously used, which seems to be rational and judicious.

To the majority of those who will use the book, the actual numerical solution of a special problem will doubtless be the easiest explanation of the mode of calculating a dam section, but it is to be regretted that there was not added a page giving a figured diagram and formulae for those who are accustomed to calculations of the sort. Uniformity of nomenclature is also desirable. In one part of the book *d* stands for one thing and in another part for another thing. There are several typographical errors, which are inexcusable in a scientific work and lead one to question the reliability of formulae given. The term *density* is used throughout as synonymous with *weight*, which is not correct. There are some rather odd and slovenly expressions which strike one somewhat disagreeably as being out of place in a book of this kind.

It would have been well if the author had taken advantage of his opportunity to point out the fact that there is less danger of failure by crushing of the masonry at the toe in a dam across a narrow gorge curved down stream, than in one of the same section either straight or curved up stream so as to produce what is called arch-pressure. It would have done no harm to give the demonstration of this fact, although it might have led to convulsions among the advocates of curved dams similar to those which attack the believers in underground transit when it is hinted that a tunnel may be damp and disagreeable at times.

On the whole, the author may be congratulated on having produced a valuable addition to dam literature.

*Passenger Fares.*—This is the title of a pamphlet which has been issued by Mr. George DeHaven, General Passenger Agent of the Chicago & West Michigan and the Detroit, Grand Rapids & Western railroads. It is printed at Grand Rapids, but no price is shown. It is a brief argument, based on a good deal of study, to show that with very few exceptions passengers are carried at a loss and have been thus carried practically ever since railroads were started, and that the loss is made up by earnings on freight. In the course of Mr. DeHaven's studies he has made a lot of "random notes" on passenger transportation, going back to the year 1285, and these are given in the pamphlet in chronological order. These notes are of a good deal of interest, the author having brought together numerous interesting facts concerning transportation history which one is likely to hunt for in many books. He notes, for instance, that the English Parliament first levied tolls for repairing roads in 1346; and that in 1610 the use of coaches had become so prevalent that a bill was introduced in Parliament to restrain their excessive use, as they were damaging the business of the boatmen on the Thames River. The first omnibuses appeared in Paris in 1632. Regular mail between Philadelphia and Pittsburgh was established in 1786; time, seven days; fare, \$20; coaches once in two weeks, 14 lbs. of baggage free. The first "limited" was in 1793, when a coach running from Boston to New York in 3½ days charged 4d. per mile, while the regular line took 4 days and charged only 3d. per mile. This "limited" had "small, genteel, easy carriages with smart, good horses." Each coach took only four inside passengers. The first "limited" between New York and Philadelphia was in 1800. It started at 1 p. m. and reached the other end of the road at 8 o'clock the next morning, the same time as the regular stage starting five hours earlier. The extra fare was \$3, making \$8, gross, on the fast stage. The declaration that charges for freight should be what the traffic would bear was made by Charles Elliott in 1840. An agreement look-

ing to the regulation of competition was had between the four trunk lines leading west from the Atlantic seaboard in 1855; "an army of drummers and runners was dispensed with," or at least that seems to have been the intention, and "joint agents were maintained at all important points." In that year an agreement was made materially reducing the rates of speed, but it did not last long. An advertisement of an excursion from Philadelphia to New York Bay and return, July 4, 1844, gave the price of a single ticket as \$2, for a gentleman and lady \$3, and for children and servants 75 cents each. The last half-dozen pages of these notes deal chiefly with passenger rates on the various roads and in various states, and they are brought down only to the year 1865. Fifteen pages of the pamphlet are taken up with abstracts of the present laws of each state and territory relating to passenger fares, and brief summaries of the practice in the different states as regards passenger and baggage rates.

#### TRADE CATALOGUES.

*Brakeshoes.*—We are in receipt of a 31-page pamphlet just issued by the Sargent Co., Chicago, in which are given the results of laboratory and service tests of the "Diamond S" brakeshoe. This shoe was illustrated in our issue of Sept. 24 and Nov. 26 we published an account of tests made on the brakeshoe testing-machine at Wilmerding, Pa. The Sargent Co. has now put in very convenient form for reference the information which has lately been collected regarding this new shoe. The greater portion of the pamphlet is taken up with quite a full abstract of the report of the recent Wilmerding tests, conducted by Mr. J. C. Whitridge, of the *Railroad Gazette*; the tabulated results are given in an appendix. The main results of the road tests are contained in a general discussion of the new shoe by the Sargent Co. and the relative wear of "Diamond S" and plain cast-iron shoes is well shown by half-tone engravings made from photographs of such shoes used in the same service.

This pamphlet will be sent out only upon application to the offices of the Sargent Co. The general offices are at 675 Old Colony Building, Chicago.

*Car Coupler Defects.*—An attractive publication is a pamphlet issued by the Railroad Supply Co., Chicago, entitled "Defects of the M. C. B. Couplers and their Cures," which is always a subject of much interest. There are many engravings illustrating fully the points brought out in the discussion, which add to the value of the book. The mechanism of the Hien coupler is well shown.

An appendix contains brief descriptions of the Barr vestibule, Walhaupte tie plate, Economy journal box lifter, Walhaupte cattle guard, Chicago crossing signal and the Anchor tie-plate rail brace.

*The American Railway Electric Light Co.*, of 14 Stone street, New York City, recently issued a small catalogue in which the company's new automatic electric lighting apparatus for railroad cars is described and illustrated. This is an axle light with auxiliary storage batteries. For description and tests see *Railroad Gazette* of June 8, 1894, and May 14, 1897.

#### TECHNICAL.

##### Manufacturing and Business.

Buckeye couplers have been specified on the 500 box cars now being built by the Michigan-Peninsular Car Co. for the Cincinnati, Hamilton & Dayton.

The Berlin Iron Bridge Co., of East Berlin, Conn., has a contract for a new drawbridge over the South Shrewsbury River, in Monmouth County, N. J. This bridge is to be 180 ft. in length and 40 ft. in width. The Berlin Company have the contract for both the substructure and superstructure.

The Charles Hillman Ship & Engine Building Co., Philadelphia, Pa., is erecting a large boiler shop 100 x 40 ft.

The Pennsylvania Car Wheel Co., of Pittsburgh, capital \$100,000, was chartered Jan. 15 with these directors: Joshua W. Rhodes, Allegheny, Pa., President; Wm. L. Elkins, James O. Rhodes, Pittsburgh; Chas. V. and Alex. W. Slocum, Buffalo.

The contract for erecting the buildings for the new rolling mill plant at Scottdale, which is to be operated by the Old Meadow Rolling Mill Co., has been awarded to the Shiffler Bridge Co. The main building will be 60 x 300 ft., with two lean-tos 26 x 300 ft., a boiler house 40 x 80 ft., and a foundry 40 x 80 ft. The buildings are to be of steel construction and fireproof. The Case Mfg. Co., of Columbus, O., was awarded the contract for a 23-ton electric traveling crane, to travel the entire length of the main building. The contracts for engines, boilers, etc., have not been let.

The Wellman-Seever Engineering Co., of Cleveland, has closed a contract to supply the Union Dry Dock of the Erie Railway at Buffalo with a cantilever electric crane with a single overhang, the span to be 170 ft.

Stowell & Cunningham, of 51 State street, Albany, N. Y., have been appointed inspectors of the steel anchorages for the new East River Bridge.

Stanley G. Flagg & Co., of Philadelphia, have opened a New York office in the St. Paul Building, to be under the management of C. A. Jaynes.

Mr. J. H. Long has been appointed General Sales Agent of the Cloud Steel Truck Co., with office in Chicago.

The Pittsburgh Woven Wire Fence Co., of Pittsburgh, Pa., has been granted a charter of incorporation. The Directors are: John H. Silliman, Owen W. Sadler, Bidle Authors, David K. Boas and Jacob Schuman, of Pittsburgh. The capital stock is \$200,000.

An application for a charter of incorporation has been made by J. & J. B. Milholland Co., of Pittsburgh, builders of hoisting engines and general machinists. The incorporators are: James Milholland, H. C. Milholland, Joseph McConnell, W. P. Potter and H. E. Lineaweaver.

The regular quarterly meeting of the Davis & Egan Machine Tool Co., of Cincinnati, was held on Jan. 12. The officers for the past year were re-elected: Charles Davis, President; W. H. Burtner, Vice-President and Treasurer; B. B. Quillen, Secretary and General Manager. A dividend of 3 per cent. was paid to all stockholders out of the earnings of the past three months making a 12 per cent. dividend for the year.

The Ellis & Lessig Steel & Iron Co., Ltd., of Pottstown, Pa., has decided to erect an open-hearth steel plant of two 20-ton furnaces and a 30-in. universal mill. They are now considering plans and receiving estimates. The orders for machinery and buildings will be placed immediately after plans have been adopted. J. B. Lessig is Secretary and Treasurer.

Wm. McIlvain & Sons, of Reading, Pa., will close down on Feb. 1, and the plate mill will be sold in order to settle the estate and interest in the firm of M. C. McIlvain, deceased.

The Pittsburgh Bridge Works, of Pittsburgh, Pa., has removed its Minneapolis office to St. Paul.

The Payne Works, located at Elmira, N. Y., and which have been shut down for over a year, will be opened again. The plant, including the real estate and machinery, was sold for \$45,300. It is announced that the plant will be reopened by B. N. and B. W. Payne, who will act as representatives of Mrs. A. R. Payne, Helen A. Payne, and S. Kate Payne, the new owners. The Payne Engineering Co., of New York, who handle the Payne engines, has been having them built during the time the Payne Works were closed by a firm in Newburgh, but the business will be brought back to Elmira.

The Boston & Maine and Maine Central railroads have awarded a contract to the Weber Railway Joint Mfg. Co., Cotton Exchange Building, New York City, for all rail joints for both new and old rails that will be needed during 1898.

##### Iron and Steel.

The Steubenville furnace of the Riverside Iron Works, Wheeling, W. Va., has been blown in under lease to the Aetna Standard Iron & Steel Co., of Bridgeport, O.

Andrew Brady, Manager of the Colebrook furnaces of the Lackawanna Iron & Steel Co., of Scranton, Pa., has resigned, his resignation to take effect March 1.

The name of the Forest City Wire & Iron Co., of Cleveland, has been changed to the Forest City Steel & Iron Co.

Work is being pushed at North Lebanon, Pa., furnaces, preparatory to putting in blast furnace No. 1, which has been idle for the past 18 months.

The Frank-Kneeland Machine Co. was awarded the contract for constructing the new 38 in. blooming mill for the new open-hearth steel plant at Homestead on which the work of building was started last week by the Carnegie Steel Co. The improvements to be made will amount to between \$300,000 and \$400,000. Other improvements for the plants at Homestead and Braddock, under way in the past three weeks, are about completed.

W. J. Adams will erect at Joliet, Ill., a three-story brick factory, 66 x 120 ft., for the manufacture of wire fence and a general line of iron work.

##### New Stations and Shops.

On Dec. 24, 1897, an ordinance was passed by the City Council of Dayton, O., providing for the construction of a new central passenger station in that city. This ordinance has now been accepted by the railroad companies interested, who have incorporated the Dayton Union Railway Company. Bids will be received and contracts let for the new station as soon as plans and specifications have been adopted, probably within 90 days. The station will be located about on the site of the old one, but the dimensions and material to be used in the construction of the building have not yet been determined upon.

##### Interlocking.

At Springfield, Ill., on Jan. 14, the Illinois Railroad and Warehouse Commission rendered a decision in favor of the Illinois Central against the Peoria, Decatur & Evansville, allowing the Illinois Central to cross the tracks of the defendant company at grade in the city of Mattoon. Defendant had claimed that an underground or overhead crossing would be better for both roads, but plaintiff showed this to be impracticable, and the Commission decides that plaintiff may cross at grade, and that an interlocking plant must be erected and maintained at the cost of both roads. A plan must be filed within 60 days.

##### Pig Iron Production in December.

According to the monthly report of the production of pig iron, as given in the *Iron Age*, there were 188 fur-



naces in blast Jan. 1, with a weekly capacity of 226,608 gross tons against 190 furnaces in blast Dec. 1, 1897, with a weekly capacity of 226,024 gross tons, and against 154 furnaces in blast Jan. 1, 1897, with a weekly capacity of 159,720 gross tons. The stocks sold and unsold Jan. 1 amounted to 736,366 gross tons against 723,885 tons on Dec. 1, 1897.

#### Air-Brake Litigation.

In our issue of Jan. 7 appeared a note under this head which is corrected by the following letter from the New York Air Brake Co:

"No injunction was issued by the Court, but the road was allowed four months in which to remove the infringing valves, and the Court stated that unless it was done at that time an injunction would be issued. It is not the brake which is being manufactured and sold by the New York Air Brake Company at this time which was the subject of litigation, but was an old form of valve which this company have not manufactured or sold for the past three years."

#### A New Chain Pipe Wrench.

The cut herewith illustrates a drop-forged, steel chain pipe wrench for gripping, turning or holding pipe, bolts, bars, shafts, etc., from  $\frac{1}{8}$  in. to 12 in. in diameter. It is made in seven sizes and either cable or flat-link chain can be used. It has duplicate reversible, interchangeable jaws, serrated on both sides. The teeth are of saw temper, and may be sharpened by filing, obviating the necessity of a blacksmith's assistance when the teeth become dull.

The chains swing from the center, and can be used on either side of the jaws. If the teeth on one side break the tool is not disabled, as it can be used instantly on the other side. The chain can be changed when necessary in a minute or two.

The makers claim that this tool is equally efficient on fittings and straight pipe, in corners, against walls, between floors, in ditches or for overhead work. It is manufactured by J. H. Williams & Co., 31 Richards street, Brooklyn, N. Y.

#### The State Line Interlocking.

As noted in another column of this issue, the members of the Railway Signaling Club and their friends visited the State Line Interlocking on Jan. 11. We note a few features of this plant supplementary to those given in the description published in our issue of Dec. 17.

The aggregate length of the locking bars in the machine is 2,500 ft., and there are over 900 locking dogs, yet, as shown by the illustration of the machine, the locking is remarkably compact. The grouping of the levers so that in all ordinary cases the signalman can clear the signals for a train without walking more than one-third the length of the tower is found highly satisfactory, simplifying the work very much. The pipe connections used at this plant aggregate nearly 62,000 ft. in length, equal to about 12 miles, and to 47 tons in weight. The length of wire used was 109,000 ft., or about 21 miles. At certain points where connections are carried under the tracks, they are supported by a steel tie of special design. The foundations for the rod connections are of the improved wooden design, illustrated in the *Railroad Gazette* of Jan. 7. The crank and compensator foundations are set in concrete.

The most of the signal arms are painted the usual colors, red and green, but those for the Chicago & Western Indiana and for the Pennsylvania are all painted yellow, and those for the Pennsylvania are of the standard design used on that road, in which the arm, when in the all-clear position, hangs parallel to the post. The work at this tower is done at all hours by two men. They work eight hours each, so that six men, with one repairman and a lamp man, constitute the whole force. The number of trains passing each 24 hours is about 290, and about 50 train orders and 50 ordinary telegrams are handled daily.

This interlocking will be under the direction of George Espy, Signal Engineer of the Chicago & Western Indiana.

#### THE SCRAP HEAP.

##### Notes.

Binghamton Division, No. 154, of the order of Railway Conductors, has adopted unanimously a resolution condemning and repudiating the Railway Conductors' Club of North America.

On the Atchison, Topeka & Santa Fe, passengers riding on annual passes now have to give the conductor, each trip, their autograph, on a card which is afterward sent to the General Manager.

The Central Vermont Railroad, which runs a freight steamer between New York and New London, now employs a single crew of freight handlers, living on the boat, and these men do the work at both ends of the line. Heretofore there has been a separate gang at each end.

Porters wearing red caps, employed exclusively to attend passengers alighting from incoming passenger trains, are now employed in Chicago at the stations of the Chicago & Northwestern and the Illinois Central, and also at the Polk street and the Grand Central stations.

The Pittsburgh Terminal Warehouse & Transfer Co. has been formed at Pittsburgh by Capt. James A. Henderson and others interested in river transportation. It is said that the company will build a steel storage warehouse to cover over three acres of ground.

The Illinois Central has issued a circular to employees, stating that arrangements have been made with the Railway Officials and Employees' Accident Association to insure them at reduced rates against accidents and requesting them to avail themselves of the offer. The cost of the insurance is shared by the company.

A press dispatch from Montreal says that there is a movement on foot to get the Dominion government to take over various poor railroads in the maritime provinces and work them in connection with the Intercolonial. There are 16 roads with a total length of 993 miles. Only one of them earns as much as \$3,000 per mile per year.

On the Elgin, Joliet & Eastern 283 men have worked under Brown's discipline during the past year; of these 14 received demerit marks in such number that, under the rules, they had to be discharged, 107 had perfect records and 25 received special credits. The demerit marks recorded during the year represent, on the basis of one day's wages for each mark, \$4,222, and this represents the wages saved by the men as compared with the former plan of suspensions for misbehavior.

The Governor of Mississippi, in his message to the Legislature, has recommended the repeal of the laws under which the railroads are exempt from taxation until they shall have earned 8 per cent. on their cost. He says that certain roads have long been able to pay 8 per cent., but have refrained from declaring a dividend so as to avoid payment of taxes. The Governor also recommends prohibiting the running of freight trains on Sunday, and the prohibition by law of combinations between railroads or any effort to restrict competition.

#### The Pennsylvania Limited.

The Pennsylvania Railroad announces complete new equipment for its 24-hour limited trains between New York and Chicago, 23 new cars having just been turned out of the shops of the Pullman Company, at Pullman, Ill. The exterior of these cars is painted in colors, green below the window sills and cream color above, with lettering and ornamentation in gold. One of the trains consists of seven cars and was exhibited last week in Chicago, Philadelphia and Jersey City. On this train the observation car is named "Fortuna," and is spoken of as the pride of the Pullman shops. It contains, in addition to the observation room, six exclusive compartments, each finished in a different colored wood, and furnished to correspond. One compartment is finished in Circassian walnut; another in Tobacco mahogany; another in English oak; another in vermilion; another in rosewood; another in St. Jago mahogany. The upholstery and drapery in each of these compartments is wrought tapestry. The observation room contains a handsome secretary and bookcase. The woodwork of this car is most ornate and beautiful. The ceiling is elaborately decorated in green and gold. The ceiling of the observation platform is dome-shaped and is about 9 ft. in diameter. The whole train is lighted by electricity, produced by a dynamo in the baggage car, and also has Frost lamps for gas. The other cars are as handsome in their way and as tastefully designed as the "Fortuna." Each sleeping car has one stateroom, and the staterooms are finished in white (or very light colors) and gold. All the vestibules are full width and these and the outer passageways have interlocking rubber tiling. The trap-door portions of the vestibule floors are fitted with springs so that they can be dropped quickly without slamming.

#### The Florida Limited.

The Southern Railway has put on its Florida fast train for the season, and Philadelphia newspapers report that each of the trains is made up wholly of new cars. The time through from New York to Jacksonville is 26½ hours. The cars are fitted up with all the luxurious appliances of the best limited trains, and there is a compartment sleeping car; and, according to the credulous Philadelphia reporter, the Southern has one feature not to be found on any other road; that is, an engine which can haul 33 sleeping cars at the rate of 60 miles an hour. Moreover, there are three of these marvelous machines. Possibly the reporter was confused and meant to say that all three of them together could "yank" 33 cars.

#### The Trial of Captain Carter.

The trial by court martial of Capt. O. M. Carter, Corps of Engineers, U. S. A., opened in Savannah, Jan. 12, Brig.-Gen. Elwell S. Otis presiding. Four charges were read, each charge containing from one to twenty specifications. Frank P. Blair, of St. Louis, associate counsel for Captain Carter, put in a formal plea of the statute of limitations upon all the charges dating back as far as two years. This plea was sustained by the court, which, in so doing, leaves only those charges pertaining to the work in Cumberland Sound and in the Savannah district for the last two years to be investigated.

#### Change of Gauge Proposed for the Honduras Line.

The narrow gauge road in Honduras, extending from Puerto Cortes south through San Pedro to La Pinita, about 60 miles, is soon to be made standard gauge. A. R. T. Lackie, of Puerto Cortes, is Chief Engineer.

#### Commercial High School for Magdeburg, Prussia.

A Government Consular Report states that the Prussian government is about to establish a Commercial High School at Magdeburg. The existing commercial schools are of lower grade and lack competent instructors. The teachers are either of the commercial class, who have had no pedagogical training, or are trained teachers who have had no instruction in special mercantile matters. The plan includes in all 19 professorships, only about nine of which will be new positions, the other 10 being taken from the various technical and high schools of Magdeburg. The curriculum covers the four modern languages, English, French, Spanish and Russian; studies in political economy, finance and statistics, the commercial exchange, commercial geography and history, insurance, banking, stock exchange, transportation and customs; studies in technology, physics, and descriptive natural history; studies in state and citizens' rights; studies in commercial intercourse and in mathematics. This is another step in the policy of the German Empire to instruct its citizens so as to insure the extension of trade with foreign countries.

#### LOCOMOTIVE BUILDING.

The Michigan Central is building six six-wheel switching engines at its Jackson shops.

The Seaboard Air Line has placed an order with the Pittsburgh Locomotive & Car Works for seven consolidation locomotives.

The Baldwin Locomotive Works are building one locomotive for the E-Quimalt & Nanaimo Railroad.

The Quakertown & Eastern Railroad, H. S. Funk, Secretary, Springtown, Pa., is in the market for one locomotive. The road is now under construction.

The Arkansas Central Railroad, now under construction, will soon be in the market for one new locomotive. N. B. Kendall, of Fort Smith, Ark., is General Manager.

The Chicago & Northwestern has placed an order with the Schenectady Locomotive Works for five Class A eight-wheel passenger engines, similar to those illustrated in the *Railroad Gazette* of Oct. 11, 1895, and six six-wheel switching engines, Class M.

The Mobile & Ohio has placed an order with the Rogers Locomotive Co., of Paterson, N. J., for 10 10-wheel locomotives, five for freight and five for passenger service. The former will have 56-in. and the latter 62-in. driving wheels. In other respects the locomotives will be built in accordance with the following specifications, which are the same as used in building a number of engines for the same road within the past two years: Cylinders, 18 x 26 in.; weight on drivers, 98,000 lbs.; total weight, 126,000 lbs.; wheel base, total, 22 ft. 3 in., driving, 12 ft.; boilers, radial stayed wagon top type, 60 in. in diameter outside at first course, with 248 iron tubes, 2 in. in diameter outside and 13 ft. long; firebox, Carbon steel, 9 ft. long, 2 ft. 9½ in. wide and 72 in. deep, front, and 64 in. back. The tender frame will be of wood, tender trucks Mobile & Ohio standard, with cast-steel bolsters, wheels 33 in. chilled cast iron; hammered iron axles; tender capacity, 4,000 gals. United States metallic packing, Richardson balanced valves, Monitor injectors, Coale safety valves, magnesia sectional boiler covering, Nathan lubricators, Leach sanding devices, Gould couplers (rear of tender), New York air-brakes and Handlan's headlights will be used on all of the locomotives. The passenger engines will be equipped for steam heat.

#### CAR BUILDING.

It is reported that the Pittsburgh & Western is in the market for 500 cars.

The Florida Central & Peninsular has placed an order with the Mount Vernon Car Co. for 250 fruit cars.

The new Quakertown & Eastern Railroad, referred to in the Locomotive Building column, wants three passenger and three freight cars.

The Illinois Car & Equipment Co. has an order for 50 flat cars for the Hanover Construction Co., which will be built at the Anniston shops.

The Wheeling & Lake Erie is said to be about to order some cars, but nothing definite had been decided upon up to the time of going to press.

The Lake Shore & Michigan Southern has placed an order for 500 coal cars with the Buffalo Car & Mfg. Co. These will be equipped with Simplex bolsters.

Nelson Morris is in the market for 10 tank cars, the order for which will be placed this week. It is understood that the number may be increased and a larger order given.

The Arkansas Central Railroad, referred to in the Locomotive Building column, will soon order one combination car, one passenger coach and 10 flat and five box cars.

The Pittsburgh & Lake Erie has placed an order with the Michigan-Peninsular Car Co. for 500 coal cars of 60,000 lbs. capacity. Four hundred of these cars will be equipped with Simplex bolsters and 100 with American steel bolsters.

The Duluth & Iron Range on Jan. 17 placed an order for 300 ore cars of 60,000 lbs. capacity with the Illinois Car & Equipment Co. These cars will be equipped with Barber trucks, Tower couplers, National hollow brakebeams and McCord journal boxes.

The Minneapolis & St. Louis has let contract for 200 box cars to the Illinois Car & Equipment Co., 175 of which will be equipped with Simplex bolsters and 25 with Fox trucks and Simplex body bolsters. Monarch brakebeams and McCord journal boxes are also specified.

The Cincinnati, New Orleans & Texas Pacific has placed an order with the Ohio Falls Car & Mfg. Co. for 200 coal, 200 box and 100 furniture cars, for immediate delivery. The road is now receiving 100 stock and 100 box cars from the same car-building works, which were ordered last fall.

We mentioned last week the orders placed by the Mobile & Ohio for 300 coal cars with the Terre Haute Car & Mfg. Co. and 300 box cars with the Ensign Mfg. Co. Orders have also been placed by this road with the Mt. Vernon Mfg. Co. for 200 box cars and with the Pullman Palace Car Co. for 200 box cars, making a total of 1,000 altogether.

The Southern Pacific has placed an order with the Rodger Ballast Car Co. for 100 of their "Standard" ballast cars and two of their standard distributing cars. These cars are to be 60,000-lb. capacity, M. C. B. standards, equipped with air-brakes, and are arranged for use in coal service when not in use for ballast cars. They are to be delivered by March 5.

For the past year the New York, New Haven & Hartford Railroad Co. has been operating on the shore line express trains a copper covered car which has proved so satisfactory that they have decided to experiment further with metal sheathing for coach exteriors. To this end a car will be plated with sheet aluminum and another with aluminum bronze. W. P. Appleyard, the Master Car Builder, with whom the idea originated, claims for metal covered cars durability, economy and a saving in time in repairing.

On Jan. 12 two of the three new trains recently built for the Pennsylvania Limited by Pullman's Palace Car Co. were put in service, one train leaving Chicago and one New York on that day. The interior finish of the cars is extremely elegant, even for these days of handsome passenger equipment, and they are supplied with all the luxuries and conveniences usually found on trains of this class. The lower parts of the outsides of



the cars are painted dark green, the upper parts cream color, which is a departure from the usual colors of the road.

The Boston Street Railroad Co. is in the market for 125 open cars.

The Nassau electric railroad of Brooklyn, N. Y., will build 60 new open cars at its own shops.

The Metropolitan Street Railroad Co. has placed an order with the J. G. Brill Co., of Philadelphia, for 50 closed cars.

The Brooklyn Heights Railroad has ordered 20 closed car bodies from the St. Louis Car Co. and 10 from the John Stephenson Co., Ltd., and has sent out specifications for 50 new open cars, to be 35 ft. long over all, with four fixed and eight reversible seats.

#### BRIDGE BUILDING.

**Altoona, Pa.**—The Grand Jury approved the report of viewers appointed to view the sites for two bridges over Bald Eagle Creek, in Snyder Township.

**Atlanta, Ga.**—It is reported that the city will make an appropriation of \$50,000 toward the construction of a viaduct across the railroad tracks at Mitchell street.

**Beaver Falls, Pa.**—The Smith's Ferry Railroad, which was incorporated in August to build a steam railroad from Lisbon, Pa., to East Liverpool, 30 miles, will build one bridge, 400 ft. long. J. L. B. Dawson, of Beaver Falls, is President, and David McNahan, Secretary and Treasurer.

**Bellaire, O.**—The application of the Bellaire & Benwood Bridge Company for permission to build a highway bridge over the Ohio River between Bellaire, O., and Benwood, W. Va., has been granted, with the modifying condition that the span be made 800 ft.

**Boonville, Mo.**—Concerning the proposed bridge at Boonville, in which A. J. Tullock, proprietor of the Missouri Valley Bridge & Iron Works is interested, the bridge is for highway and street railroad traffic, and will be a high bridge, consisting of several long spans, designed in accordance with the requirements of the Missouri River Commission. The plans have been prepared, and approved by the Secretary of War, and adopted by the local company at Boonville. The bridge in general is similar to all Missouri River bridges. The superstructure will be constructed of steel, and pneumatic piers extending to rock. It is expected that the bridge will be built any time within the next two years as soon as financial arrangements therefor can be perfected.

**Buffalo, N. Y.**—Senator Lamy has introduced a bill in the Legislature for a new bridge over the canal at Erie street.

**Canton, Mo.**—A company has been formed to build a bridge at Canton, across the Mississippi River, and a bill has been introduced in Congress, by Mr. Lloyd, authorizing the project. Among those mentioned in the bill are George Ellison, Edward J. Goodrich, Hayden J. McRoberts, Cyrus M. Bradshaw, C. W. Barrett and Walter M. Henton.

**Denver, Colo.**—The engineer of the Board of Public Works estimates the total cost of building the Fourteenth street viaduct at \$324,000.

**Jasper, Tex.**—Work is progressing on bridges over two large creeks at Jasper Southern Railroad, which will require about 700 feet of piling.

**Lewiston, Ida.**—There will be a bridge across Clear Water River, on the Lewiston extension of the Northern Pacific, which will require five fixed Howe truss spans, 150 ft. long, and one draw span about 250 ft. in length.

**London, O.**—Contracts have been awarded for building three bridges in Madison County, as follows: Bellefontaine Bridge & Iron Co., Bellefontaine, O., first bridge, \$1,900; New Columbus Bridge Co., Columbus, O., second bridge, \$739; Massillon Bridge Co., Massillon, O., third bridge, superstructure, \$984.

**New York.**—At a recent meeting of the East River Bridge Commission plans and specifications for the steel towers of the new structure submitted by Chief Engineer L. L. Buck were approved, and it was decided that bids be invited at once. The engineer estimates that the total cost of the steel towers will be between \$700,000 and \$800,000.

Bridge Commissioner Shea asks for \$1,345,831, to be used in the maintenance of bridges under his control, for rent, and contingencies. Of this amount, the Borough of Manhattan is to receive \$271,681.88, the Borough of the Bronx, \$64,500; the Borough of Queens, \$65,050; the Borough of Richmond, \$8,600; Brooklyn Bridge, \$901,761.68; all other, except four bridges over Newtown Creek, \$47,550; repairs to three bridges over Gowanus Canal, \$85,000; rent and contingencies, \$35,000.

**Pittsburgh, Pa.**—A bill has been introduced in Congress by Senator Quay, extending for two years the time within which the Pittsburgh & Mansfield Railroad Co. is authorized to build a bridge over the Monongahela River.

Charles Davis, County Engineer (Allegheny Co.), recommends an estimate of \$89,100 for his office for 1898, as follows: Rebuilding six bridges, \$29,600; erecting 15 new bridges, \$49,800; repairs and maintenance, \$7,400; other expenses, \$2,300. The new bridges recommended are distributed in all parts of the county.

**Plainfield, Mich.**—It is reported that the question of an appropriation of \$10,000 for building a bridge where the Plainfield road crosses the river will be put to vote at the spring election.

**San Patricio, Tex.**—The County Commissioners (San Patricio County) have authorized plans and estimates for a bridge over the Nueces River.

**Shreveport, La.**—The Shreveport & Red River Valley Railroad, now building along the Red River valley from Shreveport to Conshatta, La., a distance of 64 miles, has had a bill introduced in Congress to authorize them to build a bridge across the Loggy Bayou in Louisiana. G. W. Fouke, Texarkana, Tex.; W. C. Taylor, and Hunter Bros. & Co., Shreveport, La., are interested in the road.

**Wapello, Ia.**—The Missouri Valley Bridge & Iron Works, Leavenworth, Kan., have the contract to build a steel bridge over the Iowa River at Wapello, to cost \$45,000.

The County Supervisors (Lousia County), it is reported, have granted a petition for building a wagon bridge across the Iowa River, one mile north of Wapello.

**Woonsocket, R. I.**—Frank H. Mills, City Engineer,

recommends that the Winter street bridge over Mill River be rebuilt.

#### MEETINGS AND ANNOUNCEMENTS.

##### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Georgia Railroad & Banking*, quarterly, 2% per cent., payable Jan. 15.

*Great Northern*, quarterly, preferred, 1½ per cent., payable Feb. 1.

*Huntington & Broad Top*, preferred, 2½ per cent., payable Jan. 25.

*Lake Erie & Western*, quarterly, preferred, 1¼ per cent., payable Feb. 15.

*St. Paul, Minneapolis & Manitoba*, quarterly, 1½ per cent., payable Feb. 1, 1897.

*Cincinnati, Hamilton & Dayton*, quarterly, preferred, 1¼ per cent., payable Feb. 8.

*Nashville, Chattanooga & St. Louis*, 1 per cent., payable Feb. 1.

*Texas & Pacific Coal Co.*, 1 per cent., payable Jan. 23.

*Lake Erie & Western*, preferred, 1¼ per cent., payable Feb. 15.

##### Stockholders' Meetings.

*Southern Railway Co.*, general, Richmond, Feb. 18.  
*Chicago Junction Railways & Union Stock Yards*, Jersey City, N. J., Feb. 10.

##### Western Railway Club.

A meeting of the Western Railway Club was held Tuesday, Jan. 18, at the Auditorium Hotel, Chicago. The subject of "Rails" was discussed, the principal data being presented in several short papers, the most important of which was "Data from Rail Tests," by Mr. F. A. Delano; and "Rails, Past and Present," by Mr. E. C. Potter. A more detailed report of the meeting will be given in our next issue.

##### Engineers' Club of Cincinnati.

The tenth annual meeting of the Club was held on Dec. 29, 1897, with an attendance of 19 members and a few visitors. Col. Latham Anderson was elected to honorary membership. It was decided to renew the lease from the Literary Club for the use of their rooms for the meetings of the Club for a term of three years, in accordance with the provisions of the present lease. The death of Thos. D. Lovett was reported and a committee appointed to prepare suitable resolutions on same and a memoir of Mr. Lovett.

The reports of the Secretary and Treasurer for the past year were presented and accepted and ordered printed, together with a revised list of members for distribution. Officers for the ensuing year were elected as follows: President, Geo. W. Kittredge; Vice-President, W. B. Ruggles; Directors, A. O. Eisner, H. E. Warrington, Wm. C. Jewett; Secretary and Treasurer, J. F. Wilson. The retiring President, Mr. Chas. E. Lindsay, read a paper on the progress made in the various branches of engineering during the past few years.

##### Western Foundrymen's Association.

A meeting of the Western Foundrymen's Association was held Wednesday evening, Jan. 19, at the Great Northern Hotel, Chicago.

A paper was presented by Maj. Malcolm McDowell, entitled, "The Value of Metalloids in Cast Iron," which was discussed. The following topics were also presented for discussion:

Is it economical to ventilate a foundry artificially? What has been your experience?

What is the best method of lighting a foundry of modern design?

Have any members of this Association had any experience with Thurston's autographic torsion machine? If so, does it possess any merit over other forms of machines now in use for testing cast iron?

In order to overcome the variation in size of test bars incident to molding, is machining down to size to be recommended?

What is your experience as to the effect upon coke of exposing same freely outdoors?

What is your experience as to the utility and efficiency of flexible shafting for use with grinders on heavy and intricate castings?

##### The Civil Engineers' Club of Cleveland.

At the meeting held on January 11, Mr. W. H. Searles was elected Secretary and Mr. Joseph R. Oldham, Director to fill vacancies for the unexpired term. Appropriate resolutions to the memory of the late Secretary, Forrest A. Coburn, were adopted.

Mr. M. S. Greenough, M. Am. Soc. C. E., addressed the Club on the subject of Modern Gas Plants. He briefly reviewed the history of the gas manufacturing industry since its first inception near the beginning of the present century and illustrated some of its more important and recent developments. He described the works of the Cleveland Gas Light & Coke Company, of which he is President and General Manager, located at the foot of Wilson avenue; a modern regenerative retort in which a very high degree of heat is maintained and the heat produced thoroughly utilized in a most economical manner; the purifying boxes which are at present employed; the modern gas holder and frame which has developed very large proportions and the construction of which has become an important engineering problem. The lecturer also described a variety of labor-saving machinery by which a considerable economy in the working of the plant is realized; such as apparatus for coal raising and charging, for coke handling and sorting. He described the Coventry inclined retorts for the manufacture of gas by a continuous process which is aided by gravity. Leaving the subject of coal gas manufacture, he proceeded to the discussion of so called water-gas and described some works designed for its manufacture. In conclusion he illustrated upon a map of the city the system of distribution employed and described the means by which a nearly uniform pressure is maintained under the extremely varying rate of consumption during the hours of the day and night.

##### The Railway Signaling Club.

On Tuesday afternoon, Jan. 11, members of the Railway Signaling Club and invited guests, about 50 in all, visited the new State Line interlocking plant, near Hammond, Ind., a special train for the purpose being furnished by the Chicago & Western Indiana. This plant, which is one of the largest in the country, was built by the National Switch & Signal Company, and was illustrated and described in the *Railroad Gazette* of Dec. 17.

In the evening the party were the guests of the National Switch & Signal Company, and an elaborate dinner was served at the Technical Club, Chicago, at which Mr. H. M. Sperry, Western representative, presided. Early in the evening, through the courtesy of Mr. W. E. Baker, General Manager of the Metropolitan West Side Elevated, and Mr. S. S. Neff, Superintendent of the Union Loop, a special elevated train was furnished, and the signals on the Union Loop and Metro-

politan Elevated were inspected. The Metropolitan power house at Throop street was also visited. All the signals on the Union Loop, as well as on the Metropolitan Elevated, were put in by the National Switch & Signal Company.

The members of the Signaling Club assembled later in the evening at the Great Northern Hotel where the annual meeting was held. Mr. C. A. Christoffersen, Superintendent of Signals, and Mr. C. S. Rhodes, Superintendent of Telegraph, of the Cleveland, Cincinnati, Chicago & St. Louis were elected to membership. A number of committees appointed at the last meeting reported progress, but no final reports were presented. The vote on the question of what colors should be used for night signals resulted as follows: Twenty-six votes in favor of red for stop and green for all clear, nine in favor of red and white, while three recommended miscellaneous combinations. The result of the vote will be sent to the Secretary of the American Railway Association without recommendation.

Mr. W. H. Elliott, Signal Engineer of the Chicago, Milwaukee & St. Paul, presented a paper, "The Signal Engineer," which is given almost in full in another portion of this issue; this address will come up for discussion at the next regular meeting.

The following were elected officers of the Signaling Club to serve during the ensuing year:

President, George D. Fowle, Pennsylvania Railroad, Philadelphia; Vice-President, W. H. Elliott, Chicago, Milwaukee & St. Paul, Chicago; Secretary, E. M. Seitz, Chicago & Northwestern, Chicago; Member of Executive Committee, H. M. Sperry.

It was decided to hold the next regular meeting on Tuesday, March 8, at Pittsburgh, arrangements having already been made for visiting the Westinghouse plants and some of the larger rolling mills at that place.

#### PERSONAL.

—Mr. R. Ramsay, heretofore Superintendent of the Chicago, Milwaukee & St. Paul mines at Braceville, Ill., died at that place Jan. 16.

—Mr. R. W. Davis, heretofore General Freight Agent of the Buffalo, Rochester & Pittsburgh, with headquarters at Buffalo, N. Y., has resigned.

—Mr. O. O. Winter, heretofore Assistant General Superintendent of the Great Northern, has resigned to take service with the Norfolk & Western.

—Mr. Adam Earle died at Lafayette, Ind., Jan. 15, at the age of 78. He was the first President of the Lake Erie & Western Railroad Company.

—Mr. George McAlpine, heretofore Traveling Freight and Passenger Agent of the Mason City & Fort Dodge, with headquarters at Biltmore, Iowa, has resigned.

—Mr. S. B. Sanford, heretofore General Passenger Agent of the Maricopa, Phoenix & Salt River Valley, has resigned. He will be succeeded by Mr. N. O. Bicknell.

—Mr. G. H. Thomson, whose office is at 51 East Forty-fourth street, New York City, has been appointed Consulting Engineer to the Honduras Railroad Syndicate.

—Mr. Thomas P. Nicholas, heretofore in charge of the Traffic Department of the Gulf & Interstate Railway of Texas, has resigned; his resignation taking effect Feb. 1.

—Mr. W. H. Whittlesey, heretofore Central Passenger Agent of the Cincinnati, Hamilton & Dayton, with headquarters at Dayton, O., has resigned; resignation taking effect Feb. 1.

—Mr. E. E. Nettleton, heretofore General Baggage Agent of the Union Depot Company, of Kansas City, has resigned. Mr. Nettleton has held this position for 13 years. Resignation to take effect Feb. 1.

—Mr. J. N. Jarvis, heretofore Manager of the Traders' Dispatch, with office in Buffalo, N. Y., has resigned. Resignation to take effect Feb. 1. Mr. Jarvis will be Eastern Agent of the Lehigh Valley hereafter.

—Mr. W. G. Hunter, heretofore Traveling Freight Agent of the Great Eastern Line operating over the Grand Trunk, with headquarters at Battle Creek, Mich., has resigned, to take service with the Grand Trunk.

—Mr. Joseph S. Odiorne, formerly General Passenger Agent of the Louisiana Eastern & St. Louis, and later Agent of the Fidelity & Deposit Company of Maryland, died at his home in Louisiana, Ky., Jan. 11, of pneumonia.

—Mr. Charles E. Davis, heretofore Division Freight and Passenger Agent of the Buffalo & Susquehanna at Wellsville, N. Y., has resigned to take service with the Buffalo, Attica & Arcade, with headquarters at Attica, N. Y.

—Mr. W. E. Halm, heretofore General Agent of the Lone Star Steamship Company, which operates between Galveston and New York, with headquarters at Denver, Colo., has resigned to become Commissioner of the Denver Traffic Bureau.

—Mr. H. N. Hughes, heretofore Superintendent of the Northern Iowa Division of the Chicago & Northwestern, died at his home at Eagle Grove, Ia., recently. Mr. Hughes was Superintendent of the Northern Iowa Division for the eight years preceeding 1896.

—Mr. Samuel W. Stevens, heretofore Division Freight Agent of the Philadelphia & Reading, with headquarters at Williamsport, Pa., has resigned; resignation taking effect Feb. 1. Hereafter he will be connected with the firm of Day & Co., brokers of New York City.

—Mr. Lafayette Briggs, heretofore Commercial Agent of the New York, Chicago & St. Louis, with headquarters at Chicago, Ill., has resigned to become General Manager of the Traders' Dispatch, with headquarters at Buffalo, N. Y., succeeding J. N. Jarvis, resigned.

—Richard Gray, heretofore General Traffic Manager of the Southern Pacific, died at his home in San Francisco, Cal., Jan. 10, at the age of 53. Mr. Gray had been General Traffic Manager of the Southern Pacific since 1889. He retired from active work in March, 1895, on account of his health, but still retained the title of General Traffic Manager.

—Mr. Brayton Ives, at one time President of the Northern Pacific, has been elected President of the Metropolitan Trust Co., of 37 Wall street, New York, succeeding the late Thomas Hillhouse. Mr. Ives was formerly President of the Western National Bank, N. Y., and also served two terms as President of the New York Stock Exchange.

—Mr. William E. Green, heretofore Superintendent of the Chicago, Hammond & Western, with headquarters at Hammond, Ind., has resigned to accept a similar position on the Kansas City, Pittsburgh & Gulf. His headquarters are to be at Shreveport, Ind. The trainmen, heretofore under Mr. Green presented him with a



walking stick and seal ring before he left for his new home in the South.

—Mr. Harry C. Scott, who was Engineer under the Superintendent of Bridges in 1891-92 of the Lehigh Valley, died at his home at South Easton, Pa., on Jan. 13, at the age of 31. Mr. Scott was, at one time, Superintendent of Construction for the National Drying Co. of Jersey City, and later was a member of the contracting firm of Scott & Stewart. He was also at one time Borough Engineer of South Easton.

—Mr. Jacob Garabrant Leafie, President of the Leafie & Levy Ship & Engine Building Company of Philadelphia, died at his home in that city Jan. 16 at the age of 83. The concern of which he was President operates a large plant on the Delaware River front in Philadelphia, which was established in 1844. During the war of the rebellion many engines were constructed there for the government ships.

—Mr. Melville C. Smith died at his home in New York City at the age of 63, Jan. 12. When 31 years old he was chosen State Senator in Minnesota. He was a director of the New York Pier & Warehouse Co. in 1865, and later became an advocate of an underground system of rapid transit in New York. In 1868 Mr. Smith introduced into the Legislature a bill for an arcade underground railroad in Broadway, but not until 1883 did he succeed in getting a charter. At that time there were associated with him ex-President Chester A. Arthur and Cornelius N. Bliss.

—Mr. Burr Kellogg Field, Vice-President of the Berlin Iron Bridge Co., died at his home in Berlin, Conn., Jan. 13, after an illness of less than a week. Burr K. Field was born in May, 1856. He entered the Sheffield Scientific School of Yale University in 1874 and graduated in 1877 as a civil engineer. Immediately after graduation he commenced practical work among the railroads of the West. His principal experience as a civil engineer was in connection with the laying out and building of the Northern Pacific. Mr. Field had charge of the locating and building of the branch connecting the Yellowstone National Park with the Northern Pacific. In 1882 he was appointed Superintendent of Bridges in the city of Philadelphia, which position he held over a year, when he resigned to accept a position as Assistant Engineer of the Berlin Iron Bridge Co., of East Berlin, Conn. His advancement in the Berlin Iron Bridge Co. had been very rapid, and at the time of his death he occupied the position of Vice-President.

—Mr. Menard K. Bowen was elected President of the Chicago City Railway Co. at the annual meeting held Jan. 15. Mr. Bowen was born in 1858 at Jefferson Barracks, Mo. After his early education he took a course in engineering at Washington University, St. Louis, and at the age of 19 entered the government service as Assistant Engineer of Surveys of the Mississippi River. After this he was appointed Assistant Engineer of the jetty work at New Orleans. In 1880 he was identified with the St. Louis & San Francisco and later entered the street railroad service as Chief Engineer and Superintendent of the Kansas City Railway Co., after which he was appointed Superintendent of the Chicago City Railway Co. and later became its General Manager. During his connection with the road he was instrumental in bringing about many changes and extensions and reducing the operating expenses to a remarkably low figure. During this time he has also designed and improved new apparatus and machinery. Probably the most interesting and servicable work in this direction was the building of his dynamograph car for street railroads, as described and illustrated in our issue of Dec. 11, 1896. Mr. Bowen is one of the best known and highly respected street railroad officials in this country.

—Major Benjamin Butterworth, United States Commissioner of Patents, died at Thomasville, Ga., Jan. 16. General Butterworth was born in Warren County, O., Oct. 22, 1822. He studied law in the offices of Durbin Ward in Cincinnati, and was admitted to the Bar in 1861. He served in the Union Army during the Civil War and rendered gallant service, retiring with the rank of Major. Resuming the practice of law in Cincinnati, he was United States District Attorney in 1871. He was a member of the Ohio Senate in 1873 and 1874, and was first elected to Congress in 1878, and was re-elected in 1880. The Compulsory Retirement Act of the Army was written by him. In 1883 President Arthur appointed Major Butterworth a Commissioner to examine a part of the Northern Pacific Railroad, and upon the retirement of E. M. Marble from the Patent Office in September, 1883, he was appointed Commissioner of Patents. He was elected to Congress again in 1884. He also served in the Forty-ninth, Fiftieth and Fifty-first Congresses. After his retirement from Congress, he settled in Washington, and built up a large practice in patent law. He was appointed Commissioner of Patents by President McKinley in April, 1897, for the present administration. During his service in Congress there was no member who was held in more affectionate regard by his associates, irrespective of party, than was Major Butterworth, or one whose voluntary retirement was more deeply regretted. It was with much reluctance and after long hesitation that he consented to accept the office of Commissioner of Patents last year, but as soon as he did so he entered upon the discharge of its duties with zeal and energy.

#### ELECTIONS AND APPOINTMENTS.

**Alabama & Tombigbee.**—At a meeting of the stockholders and directors of this company, held at Fulton, Ala., Jan. 12, David L. Whetstone was elected Treasurer, and George R. Hannon was elected General Manager. This is a new incorporation which was noted in these columns Dec. 17.

**Alabama Great Southern.**—W. N. Cox has been appointed Road Foreman of Engines, with headquarters at Birmingham, Ala. Appointment took effect Sunday, Jan. 16.

**Baltimore & Cumberland Valley.**—At the annual meeting of this company, held Jan. 10, at Maynesboro, Pa., the following Directors were elected: Dr. I. N. Snively, succeeding J. M. Hood as President; directors, J. M. Hood, Dr. I. N. Snively, Daniel Hoover, Jacob J. Miller, J. J. Oiler, C. W. Humerichouse and Alex. Armstrong.

**Baltimore & Harrisburg.**—At the annual election of this company, which is a leased line of Western Maryland, held at Hanover, Pa., Jan. 12, the following Directors were elected: J. M. Herd, Wm. S. Rayner, C. W. Slagle, Col. John C. Legg, Baltimore, Md.; Jerome L. Boyer, Reading, Pa.; Reuben Young, R. M. Wirt, L. P. Boockley, H. E. Young, Hanover, Pa.; John A. Swope, Gettysburg, Pa.

**Baltimore & Harrisburg Eastern Extension.**—At the annual meeting of this company, held at York, Pa., Jan. 10, the following Directors were elected: John C.

Schmidt, J. W. Stacy, G. S. Billmeyer, Grier Hersh, A. B. Farquhar and George H. Schmidt.

**Baltimore & Ohio Southwestern.**—James B. Scott, heretofore Traveling Passenger Agent at Cincinnati, has been appointed District Passenger Agent, with headquarters at Cincinnati, O.

**Belleville & Clearfield.**—At the annual meeting of this company, held at Philadelphia, Jan. 12, the following directors were elected: C. W. Wilhelm, James Harris, L. T. Munson, J. J. Walsh, A. V. Hoyt, Henry Brockerhoff and M. L. Altendorfer.

**Berkley Springs & Potomac.**—At the annual meeting of the stockholders of this company, which is a part of the Baltimore & Ohio, held at Berkley Springs, W. Va., Jan. 13, the following Directors were elected: T. H. B. Dawson, John H. Buzzard, H. W. Disher, Samuel Wisner and E. P. Rhoades. At the annual meeting of the Directors, held later, the following officers were elected: T. H. B. Dawson, President; John H. Buzzard, Vice-President; H. W. Disher, Secretary.

**Black & Cache River.**—At the annual meeting of the Directors of this company, held at Sedgewick, Ark., S. L. Johnson was elected Auditor and J. E. Oliver, heretofore Secretary, was elected Assistant General Manager.

**Buffalo & Susquehanna.**—The office of Division Freight and Passenger Agent at Wellsville, N. Y., has been abolished. It was formerly held by Charles E. Davis, resigned. Effective Jan. 1.

**Buffalo, Attica & Arcade.**—Charles E. Davis, heretofore Division Freight and Passenger Agent of the Buffalo & Susquehanna, has been appointed General Freight and Passenger Agent, with headquarters at Attica, N. Y.

**Canadian Pacific.**—C. E. E. Usher, heretofore Assistant General Passenger Agent for the District of New Brunswick and the state of Maine, has been appointed General Agent of the company's line east of Port Arthur. His headquarters are to be in Montreal. A. H. Notman, District Passenger Agent at St. Johns, N. B., has been appointed Assistant General Passenger Agent, succeeding Mr. Usher. His headquarters are to be at St. Johns, N. B.

**Central of Georgia.**—E. T. B. Glenn, heretofore Chief Clerk in the office of S. C. Hoge, has been appointed Traveling Auditor, with temporary headquarters at Macon, Ga. The appointment takes effect Feb. 1.

**Chambersburg & Gettysburg.**—At the annual meeting of this company, held at Chambersburg, Pa., Jan. 12, Mr. H. O. Wood, of New York, was elected a Director.

**Chicago Great Northern.**—George L. McAlpine, formerly Traveling Freight and Passenger Agent of the Mason City & Fort Dodge at Biltmont, Ia., has been appointed Commercial Agent of the Chicago Great Western, with headquarters at Des Moines, Ia.

**Chicago Great Western.**—At a meeting of the holders of the debenture four per cent. and preferred stocks, held in London, Eng., Jan. 12, the following were elected as members of the Finance Committee: William Liddell, Chairman; Howard Gilliat, Alexander F. Wallace, Edwin Waterhouse and C. Sligo De Pothonier.

**Cincinnati, Hamilton & Dayton.**—Wood Patton has been appointed Central Passenger Agent, with headquarters at Dayton, O., succeeding W. H. Whittlesey, resigned. Appointment takes effect Feb. 1.

**Columbus, Sandusky & Hocking.**—E. L. McCune, heretofore Acting Real Estate Clerk in the office of the Superintendent and Chief Engineer at Columbus, has been appointed Real Estate Agent, with headquarters at Columbus, O. The appointment took effect Jan. 1.

**Cripple Creek Short Line.**—At a meeting of the stockholders of this company, which was incorporated Nov. 16 (see this column for Dec. 3), held at Colorado Springs, Col., Jan. 11, the following were elected Directors: W. S. Eaton, President; F. D. Rodgers, Vice-President and Treasurer; H. B. Stone, Secretary; J. R. Franklin and H. A. Clay, Directors.

**Delaware Railroad.**—At the annual meeting of the stockholders of this company, held at Dover, Del., Jan. 13, the following Directors were elected: E. Tatnall Warner, Wilmington; John P. Green, Philadelphia; Samuel Rea, Philadelphia; Hon. George V. Massey, Philadelphia; Senator George Gray, Wilmington; John H. Hoffecker, Smyrna; William T. Porter, Wilmington; Manlove Hayes, Dover; ex-Governor William T. Watson, Milford; Col. James J. Ross, Seaford; Charles J. Harrington, Farmington, and William T. Records, Laurel.

**Des Moines & Union Ry. Co.**—At the annual meeting of this company, held at Des Moines, Ia., Jan. 6, the following official changes were made: Cyrus Kirk, of Des Moines, was elected a Director, succeeding A. N. Denman, and H. D. Thompson was elected Treasurer.

**Erie & Pittsburgh.**—At the annual meeting of the Directors of this company, which is a part of the Pennsylvania Co., held at Erie, Jan. 10, M. H. Taylor was elected Vice-President.

**Fort Plain & Richfield Springs.**—At a meeting of the stockholders of this company, held at Utica, N. Y., Jan. 12, the following directors were elected: Charles Siebler, R. D. Farley, J. C. Haldin, J. J. Janeway, Irving Kent, Horace Moody, A. N. Farnham, of New York, Warren Haun, of Starkville, and A. R. Smith, of Springfield Center, N. Y.

**Georgia & Alabama.**—W. E. Algee has been appointed Division Freight Agent, with headquarters at Fitzgerald, Ga. Mr. Algee has recently been in the railway supply business in Atlanta, Ga.

**Grand Trunk.**—W. J. Hunter, heretofore Traveling Freight Agent of the Great Eastern line, with headquarters at Battle Creek, Mich., has been appointed Traveling Freight Agent of the Grand Trunk, with headquarters at Detroit. The appointment took effect Jan. 1. He succeeds William Robinson, recently resigned.

**Great Northern.**—H. C. McMicken, General Agent at Toronto, Ont., has been appointed General Agent of the company in England. This appointment is the first representative the Great Northern has ever had in England. William Harden, who is now General Agent at Portland, Ore., has been appointed General Agent at Toronto, succeeding Mr. McMicken. The title of Mr. McMicken's office will be European Traffic Agent, and his office is to be in London.

Edwin V. Holcomb has been appointed Superintendent of Dining Cars and Sleepers, with headquarters at St. Paul, succeeding George L. Bonney, who has been assigned to other duties. Mr. Holcomb has heretofore been manager of the Hotel Lafayette, at

Lake Minnetoka, owned by the Great Northern and recently burned down. S. F. Forbes has been appointed Superintendent of Car and Machine Shops at St. Paul, a newly created position.

**Robert Martin,** heretofore Contracting Agent, with headquarters at Chicago, has been appointed District Freight Agent, with headquarters at Pittsburgh, Pa., succeeding J. H. MacAdoo, resigned.

**Gulf & Interstate Railway of Texas.**—At the annual meeting of the stockholders of this company, held at Galveston, Tex., Jan. 10, the following new Directors were elected: E. S. Flint, Charles H. Moore, L. P. Featherstone, G. B. Miller and H. S. Spangler. Mr. Spangler was elected Auditor at a meeting of the Directors, held later, and was appointed Superintendent, Jan. 11, by President Weekes.

**Hannibal & St. Joseph.**—B. A. Barrows, in addition to his present duties as Cashier, has been appointed to fill the position of Paymaster on the Burlington Route, succeeding M. B. Merriman, deceased. E. C. Browne, who has been temporarily Acting Paymaster, has assumed his duties as General Manager's Chief Clerk and Secretary and Treasurer of the St. Joseph Depot Co.

**Jonesboro, Lake City & Eastern.**—The officers of this company, referred to in another column, are as follows: President and Treasurer, J. E. Jones; Vice-President, A. J. Krewson; General Manager, A. J. Kerfoot; Secretary and Attorney, E. F. Brown; Auditor, Whitney H. Stevens; Chief Engineer, C. Van Smith, all of Jonesboro, Ark.

**Kanawha Dispatch.**—Henry L. Watkins has been appointed General Agent, with headquarters at Richmond, Va., succeeding Francis T. Walker, resigned. Alfred Cary has been appointed Soliciting Agent, with headquarters at Richmond, Va., succeeding Henry L. Watkins, promoted. Appointments took effect Jan. 1.

**Kansas City, Pittsburgh & Gulf.**—The office of W. A. Williams, Superintendent of the Northern Division, has been removed from Kansas City to Pittsburgh, Kan. The change was made on Jan. 10. William E. Green, heretofore Superintendent of the Chicago, Hammond & Western, with headquarters at Hammond, Ind., has been appointed Superintendent of the Southern Division of the Kansas City, Pittsburgh & Gulf. His headquarters are to be at Shreveport, Ind. E. E. Smythe, Assistant General Freight Agent, has been appointed Assistant General Freight Agent of the Omaha, Kansas City & Eastern, the Omaha & St. Louis and Kansas City Northern Connecting, which are parts of the Kansas City, Pittsburgh & Gulf. J. C. Brown has been appointed District Passenger and Land Agent, with headquarters at St. Joseph, Mo.

**Lehigh Valley.**—Justus C. Strawbridge, of Philadelphia; Irving A. Stearns, former Superintendent of the Susquehanna Coal Company, representing Cox Bros., of Drifton, and Abram Nesbit, President of the Second National Bank, Wilkes Barre, were elected Directors at the annual meeting held in Philadelphia, Jan. 18, succeeding Robert H. Sayre, John I. Blaklee and William A. Ingham. Mr. Sayre, heretofore Second Vice-President, has become Assistant to the President and J. Andrews Harris, Jr., was elected Treasurer.

J. N. Jarvis, heretofore Manager of the Traders' Dispatch, with office in Buffalo, N. Y., has been appointed General Eastern Freight Agent, with headquarters at 355 Broadway, N. Y.

**Lineham Railway Transfer Co.**—At the annual meeting of the Directors of this company, held at Dubuque, Ia., Jan. 11, the following Directors were elected: Bart E. Lineham, D. W. Lineham, M. C. Lineham, W. S. Molo and George F. Kiesel. The officers elected were: Bart E. Lineham, President and General Manager; M. C. Lineham, Vice-President; D. W. Lineham, Superintendent; W. S. Molo, Secretary and Treasurer. These offices are at Dubuque, Ia.

**Louisville & Nashville.**—Walter D. Hines has been appointed Assistant Chief Attorney, with headquarters at Louisville, Ky.

**Maricopa, Phoenix & Salt River Valley.**—N. O. Bicknell has been appointed General Freight and Passenger Agent, with headquarters at Phoenix, succeeding S. B. Sanford.

**Newport & Sherman's Valley.**—At the annual meeting of this company, held at Newport, Pa., Jan. 14, James A. Gray and Thomas S. Martin were elected as Directors.

**New York, Chicago & St. Louis.**—A. S. Work, heretofore Traveling Engineer, has been assigned to other duties, and that office has been abolished.

James Webster, heretofore Chief Clerk in the office of General Freight Agent G. B. Spriggs, at Cleveland, O., has been appointed Commercial Agent at Chicago, Ill., succeeding Lafayette Briggs, resigned.

**Norfolk & Western.**—O. O. Winter, heretofore Assistant General Superintendent of the Great Northern, has been appointed Train Master of the Bradford Division of the Norfolk & Western.

**Northern Ohio.**—At the annual meeting of this company, held at Lima, O., Jan. 12, J. B. Conder was elected Secretary and C. B. Crites was elected Treasurer, with headquarters at Lima, O.

**Omaha & Council Bluffs Railroad Bridge Co.**—At the annual meeting of the stockholders of this company held at Omaha, Neb., Jan. 11, the old Board of Directors was elected. It comprises J. J. Brown, J. H. Millard, M. W. Wells, George F. Wright, Charles Stewart, John T. Stuart and Guy C. Barton.

**Pine Creek.**—At the annual meeting of the stockholders of this company, which is a part of the Fall Brook, held at Wellsboro recently, John Magee was elected a Director to fill the vacancy on the Board.

**Pittsburgh, Painesville & Fairport.**—At the annual meeting of this company, held at Painesville, O., the following Directors were elected: Thomas M. King, Henry W. Olliver, Pittsburgh; J. F. Taylor, Youngstown; L. E. Cochran, Youngstown, and J. Chapman, of Painesville, O.

**Ransburg.**—At the annual meeting of this company, held at Los Angeles, Cal., the following were elected Directors: Edgar Van Etten, J. N. Beckley, A. A. Dougherty, Charles Wier, Walter Rose, Mr. Warren, of Rochester, N. Y.; Messrs. Crowley and Leonard, of Arizona, and Albert Smith, of Rochester, N. Y. Edgar Van Etten, who is the General Superintendent of the New York Central & Hudson River, was elected President of the company.

This road has heretofore been referred to in these columns as the California Southern.



**Sharon Railway.**—At the annual meeting of this company, which is a part of the Erie, held at Sharon, Pa., the following officers and directors were elected: Directors, J. J. Pierce, Norman Hall, P. L. Kimberly and J. J. Spearman, of Sharon; M. H. Henderson, New Castle; Lafayette Brown, Cleveland; H. B. Perkins, Warren; H. Hunter Wykes, New York. Simon Perkins, of Sharon, was elected Vice-President.

**Shreveport & Red River Valley.**—The officers of this company, referred to in another column, are as follows: President, William Ebenborn; Vice-President, W. F. Taylor; Secretary and Treasurer, Clarence Elberbe; Chief Engineer, G. E. Otis. The central office is at Shreveport, La.

**Southern.**—B. L. Abney, heretofore Assistant Division Counsel for South Carolina, has been appointed Division Counsel, succeeding Judge J. S. Cothran, deceased.

**Stony Creek.**—At the annual meeting of this company, which is a part of the Reading, held at Philadelphia, Jan. 17, Howard Boyd and Henry C. Wentz were elected as Directors.

**Terra Haute & Indianapolis.**—At the annual election of this company, held at Terra Haute, Ind., Jan. 12, Joseph Woods of the Pennsylvania was elected a Director, succeeding J. E. Davidson, who died last August.

**Texas & New Orleans.**—At the meeting of this company, which is a part of the Southern Pacific, held at Houston, Tex., Jan. 10, Mr. W. G. Van Vleet, of Houston, Tex., was elected Second Vice-President.

**Traders' Dispatch.**—Lafayette Briggs, heretofore Commercial Agent of the New York, Chicago & St. Louis, with headquarters at Chicago, Ill., has been appointed Manager of the Traders' Dispatch, with headquarters at Buffalo, N. Y., succeeding J. N. Jarvis, resigned, the appointment to take effect Feb. 1.

**Troy & New England.**—At the annual meeting of the stockholders of this company, held at Troy, N. Y., Jan. 10, the following Directors were elected: William Shaw, James Donnelly, C. W. Tillinghast, John Knickerbacker and B. S. Stiles, succeeding George T. Lane, James O'Neil, Peter McCarthy, Thomas Baeslin and Charles S. Smith.

**Union Depot Company of Kansas City.**—At the annual meeting of this company, held at Kansas City, Mo., Jan. 11, E. S. Washburn was elected President.

**Virginia, Fredericksburg & Western.**—At the annual meeting of the stockholders of this company, held at Fredericksburg, Va., Jan. 13, Col. E. McLean was elected a Director.

**West Shore Line.**—Mr. John G. Isham, heretofore Soliciting Agent of the Empire Line at Cincinnati, O., has been appointed Soliciting Agent of the West Shore Line, with office at Cincinnati.

**Worcester, Nashua & Rochester.**—At the annual meeting of this company, which is a part of the Boston & Maine, held in Rochester, N. H., Jan. 11, the following Directors were elected: Charles A. Sinclair, Frank Jones, of Portsmouth, N. H.; John A. Spalding, Charles Holman, of Nashua, N. H.; E. B. Stoddard, of Worcester, Mass.; George W. Armstrong, of Brookline, Mass.; Frank G. Clark, of Peterboro, N. H.; Frederick S. Moseley, of Newburyport, Mass.; Albert Wallace, of Rochester, N. H.

#### RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

**Alaska Railroads.**—A bill has been introduced into the House of Representatives by Mr. McCall granting the right of way to the Alaska & Northwestern to build a road from a point on the Linn Canal, at or near Pyramid Harbor, Haines Station, or Chilkoot, north through the Chilkoot Pass or other accessible routes to the northern boundary of Alaska. The company is organized under the laws of West Virginia. Within six months after the passage of the act maps must be filed showing the proposed route, and work must be begun within three years.

**Arizona & South Eastern.**—Official confirmation is given of the statement in this column for Jan. 7 that this company is relaying a portion of its road from Bisbee, Ariz., to Benson. The weight of rails used is 60 lbs. There is no present intention, however, of extending the line south into Mexico.

**Arkansas Central.**—It is officially stated that grading has been complete on 28.5 miles from Fort Smith, Ark., east to Paris, 44.5 miles, and that track has been laid on 13.5 miles from Fort Smith to Central City. None of the road is ballasted, and there is as yet no train service. Bridges are about completed for the section to Charleston. Seventy-five teams and 180 men are at work under the direction of the company. Contracts have been let for 16 miles from Charleston to Paris. N. B. Kendall, of Fort Smith, Ark., is General Manager.

**Astoria & Columbia.**—It is officially stated that all the grading, except about one mile, has been completed on this line from Astoria, Ore., along the southern bank of the Colorado River to Goble, a point on the Northern Pacific, 60.3 miles. Twenty miles of track has been laid at the west end and three at the east end, of which five miles of the west end has been ballasted. There is no train service as yet except from Astoria to Seaside. All the bridges have been completed. About 600 men are still at work. The intermediate points on the road from Astoria are Alderbrook, Svensen, Knappa, Clifton, Westport, Marshland, Clatskanie, Beaver, Mayger and Rainier. J. H. Curtis, of Astoria, Ore., is Chief Engineer. (See this column for Dec. 10.)

**Bay, Tuscola & Huron.**—This company was incorporated in Michigan Dec. 23, under the Train Railway Law, with a capital stock of \$100,000, to build a line from Bay City and West Bay City northeast about 30 miles to the village of Sebawaing, Huron County. The incorporators are Leman L. Culver, Frank L. Wands, James Seed, George W. Granger, Frank S. Pratt, Bay City; Reuben C. Tasker, West Bay City.

**Boise, Nampa & Owyhee.**—It is officially stated that tracklaying has been completed from Nampa, Ida., south to Guffey, 24 miles, on this road which is projected to extend to Silver City and De Lamar, in Owyhee Co. Contracts are to be let about April 1 for 10 miles of grading south from Guffey. J. M. Clark, of Nampa, Ida., is Chief Engineer. (See this column for Sept. 17.)

**Canadian Pacific.**—It is reported that grading has been completed on the Crow's Nest Pass extension for 110 miles from Lethbridge, B. C., west to Nelson, 330 miles, and that rails have been laid to Pincher Creek, 65 miles. About 4,000 men are now at work on the extension. It is expected that tracklaying will reach Kootenay

Lake before the close of the year. (See this column for Dec. 24.)

**Dakota, Wyoming & Missouri.**—It is reported that work has been begun on this road from Rapid City, So. Dak., west 33 miles through the heart of the Black Hills to Mystic, a point on the Chicago, Burlington & Quincy. About eight miles of the proposed line have been completed, and the company is endeavoring to place bonds to the amount of \$30,000 per mile. About \$400,000 has been spent in the work up to the present time.

**Denton & Cambridge.**—This company is being organized in Maryland to build a line from Denton, a point on the Queen's Anna Railroad, south about 30 miles to Cambridge, a point on the Philadelphia, Wilmington & Baltimore line at Pennsylvania. At a meeting in Denton, Jan. 11, Directors were elected as follows: B. Goote Stevens, William B. Nuttle, Williston, Md.; Henry T. Nuttle, Andertown; James H. Wright, Henry B. Messenger, Federalsburg, Md.; Edward W. Liden, Smithville, Md.; Emory S. Turpin, Greensboro, Md.; Thomas W. Jones, Ridgely, Md.; Wilber Emory, Baltimore, Md.; John H. Vangesel, Henry R. Lewis, and M. Bates Stephens, Denton, Md. Thomas W. Jones, of Denton, was made President.

**East Louisiana.**—This company proposes making an extension from Covington, La., north to the state line, about 36 miles, but as yet no route has been determined upon. The present road extends from Pearl River to Covington, 25 miles. John Poitevent, of New Orleans, La., is President.

**El Paso & Northeastern.**—It is officially stated that grading has been completed for about 30 miles from El Paso, Tex., northeast toward White Oaks, N. Mex., 165 miles. Tracklaying on this section will begin Jan. 17. The work is being pushed vigorously at not less than one mile of completed track per day. Nearly all the material is now in the yards. The work is being done by the New Mexico Railway & Coal Co., of 66 Broadway, N. Y. (See this column for Dec. 10.) It is reported that the company has just placed a contract with lumber mills at Beaumont, Tex., for ties and bridge timber aggregating about 6,500,000 ft.

**Fort Smith & Western.**—A bill has been introduced into the United States Senate, by Senator Jones, extending for two years, from the passage of the bill, the time of completion of this road. The company was incorporated in Arkansas, January, 1896, with a capital stock of \$1,250,000, to build a line from Fort Smith southwest through Indian Territory to a point on the Missouri, Kansas & Texas, near McAlister. Grading was begun the following April on the section from Pacola, Ind. Ter., to a connection with St. Louis & San Francisco. (See this column for Jan. 17 and Apr. 10, 1896.) Eli J. Crandall, of Fort Smith, Ark., was one of the original Directors.

**Fulton County Narrow Gauge.**—A letter from this company states that it is expected, in the near future, that the road will be changed from three feet to standard gauge. The line extends from Havana, Ill., to Fair View, 31 miles, with a leased line from Fair View to Galesburg, 30 miles, making a total of 61 miles.

**Geneva Lake, Sycamore & Southern.**—This company was incorporated in Illinois, Jan. 13, with a capital stock of \$150,000, to build a line from a point in Walworth County, Wis., on the southern shore of Lake Geneva, south through Woodstock, Ill., to a point near Morris, Grundy County, Ill., through McHenry, DeKalb, Kendall and La Salle counties. The principal business office is in Sycamore, Ill. The incorporators and first Board of Directors are: James Brane, John D. Whalen, George Brown, H. A. Jones, George B. Morris, C. B. Brown, and Charles Kellum, of Sycamore; J. B. Castle, A. G. White, S. Baker, G. W. Greenfield, J. B. Adams, Dr. C. Winne, Louis Rohrer, F. S. Mosher and Joseph Dyas, of Sandwich, Ill.; A. M. Hill and D. S. Brown, of Genoa, Ill.; P. T. Parkhurst, F. W. Patrick, Loren Woodward and E. P. Vail, of Marengo, Ill.; Amos K. Bunker, A. R. Murphy, John R. Kellogg, George H. Hoy, V. S. Lumley, George B. Richards and Emil Arnold, of Woodstock; H. F. Jones, W. E. Wire, H. W. Meade and George W. Conn, of Hebron, Ill.

**Grand Rapids, Kalkaska & Southeastern.**—It is officially stated that this line from Van Buren, Mich., on the Chicago & West Michigan, east 33 miles through Kalkaska to Stratford, has been completed. It is standard gauge, and is laid with 60-lb. rails. The road has been turned over to the Chicago & West Michigan, under lease for ten years, which company began operation Jan. 17. William A. Smith, of Grand Rapids, Mich., is Vice-President and Treasurer. (See this column for Dec. 13.)

**Great Northern.**—During the past season this company has completed an important work between Clancy and Butte, in Montana, on the Northern Division, otherwise known as the Montana Central. All the wood trestles have been filled in with earth, and the wooden bridges have been replaced with steel, making the entire line free from wood structures. In this work two steam shovels, and part of the time three were in operation, handling about 500,000 cu. yds. of earth from pit to bank. In addition, 17 steel bridges were erected over the Boulder River, consisting of deck and through girders, varying from 40 to 50 ft. in length and requiring in all 500 tons of steel. For the substructures of the bridges 2,440 yds. of heavy granite rubble masonry were put in place.

**Irontide, Bancroft & Ottawa.**—The Ontario government has granted a subsidy of \$80,000 to this company for building 10 miles of its extension east of Baptiste, Ont. (See this column for Nov. 12.)

**James Bay.**—The Ontario government, on Jan. 12, decided to give a subsidy of \$270,000 to this road, which is projected to run from Parry Sound north through Sudbury to James Bay, a part of Hudson Bay. It is designed to open up large tracts of timber and mining lands, and to develop the fisheries of Hudson Bay.

**Jasper Southern.**—It is officially stated that the entire line, except about one-half mile, has been graded from Kirbyville, Tex., northwest to Jasper, 20 miles, but tracklaying has not yet been begun. Work is progressing on bridges over two large creeks, which will require about 700 ft. of piling. The road will not be in operation until about May 1. Arrangements have been made for the rails and rolling stock. There are no contracts to be let, as the stockholders, most of whom live in Jasper and along the line, are doing the work. W. W. Blake, of Jasper, Tex., is Chief Engineer. (See this column for Nov. 19.)

**Jonesboro, Lake City & Eastern.**—It is officially stated that 12.2 miles from Nettleton east to Lake City, Ark., is in operation, and that two miles are under construction. Preliminary surveys have been made for an extension east about 30 miles to Osceola. The officers

are given in another column. (See this column for Dec. 17.)

**Kansas City & Northern Connecting.**—It is reported that the extension of this line north from Smithville, Mo., to connect with the Quincy, Omaha & Kansas City at Pattonsburg, has been completed as far as Plattsburgh, and that train service was opened between Kansas City and that point Jan. 9. (See this column for Oct. 10.)

**Leaf & Pearl Rivers.**—This company has been incorporated in Mississippi to build a line from Hattiesburg east about 40 miles to Columbia in Marion Co. The J. J. Newman Lumber Co., of Hattiesburg, owns about one-third of the route. It is reported that work will begin at once.

**Little River Valley.**—It is reported that contracts have been let for two miles of this projected road from Neal Springs, Ark., a point on the Texarkana & Fort Smith, west four miles through Nashville to the Arkansas state line near Cerro Gorda. This road was incorporated in Arkansas Dec. 3. (See this column for Dec. 10.) D. C. Richardson, of Horatio, Ark., is President.

**Louisiana & Northwest.**—It is officially stated that grading is nearly completed on the extension of this road from Homer, La., northwest about 36 miles to Magnolia, Ark. The work is being done by the company. There are no difficult grades nor curves, nor are there steel bridges or trestles to be built. The road extends from Bienville, La., north 36 miles to Homer. J. D. Beardsley, of Gibbstland, La., is General Manager. (See this column for Sept. 10.)

**Louisville & Southeastern.**—This company, which was incorporated in Kentucky, Dec. 24, with a capital stock of \$2,000,000 (see this column for Dec. 31) is to be the successor of the Richmond, Nicholasville & Beattyville, recently purchased by Adolphe Segal, of Philadelphia. The present road extends from Versailles, Ky., southeast 61 miles to Irvine, and it is proposed to make an extension from Irvine east 36 miles to Beattyville through the counties of Estill and Lee. The incorporators are Adolphe Segal, Herman Hoopes, W. Howard Ramsay, Barclay J. Woodward, B. Gordon Bromley, Joseph A. Baker, Philadelphia; John McLeod, David Fairleigh, Louisville, Ky.; J. B. McCreary, Richmond, Ky.

**Mexican Central.**—It is officially stated that a large number of teams are at work grading at different points on the extension of this line from Jimenez, Mex., southwest to Parral, but so far no track has been laid nor bridges built. It is not likely that tracklaying will be begun for 30 days. H. R. Nickerson, of Mexico City, is General Manager. (See this column for Dec. 10.)

**Mexican Roads.**—Detwiler Brothers & Woodward are reported to have concluded a contract with George W. Pease, Chief Engineer of the American Railway & Lumber Co., of El Oro, to build a line from Tultenango, a point on the Mexican National Railway, a few miles west of Mexico City, to run north 59 km. (31 miles) through El Oro to a point 22 miles west of that city. The work was to begin Jan. 15.

**Nebraska, Kansas & Gulf.**—A bill has been introduced into the House of Representatives by Mr. Bartholdt authorizing this company to build and operate a railroad through the Indian and Oklahoma territories. The proposed line is to extend from a point in Harper County, Kan., southeast through the two territories and Denison, Tex., to Galveston. The House Committee on Indian Affairs has reported favorably on the bill.

**New England.**—It is reported that engineers have about completed plans for the proposed extension of the Norwich & Worcester Division, from Allen's Point, Conn., south six miles to Groton, where connection will be made with the New York, New Haven & Hartford. (See this column for July 9.)

**New Roads.**—It is reported that the Babcock Lumber Co., of Ashtola, Pa., has a number of men at work grading for a five-mile spur from that place to Windber to connect with the Seap Level extension of Pennsylvania.

**New York & Ottawa.**—It is officially stated that tracklaying has been completed on the Ottawa & New York Division from Cornwall, Ont., north 50 miles to Hawthorne Junction, where intersection is made with the Canada Atlantic, five miles southeast of Ottawa. A little more than 10 miles of the track is ballasted, but the rest is scarcely suitable for train service, and the line will not be operated until ballasting is completed in the spring. Temporarily the company will use the Canada Atlantic track into Ottawa, but expects to build an independent line this year. The general offices and shops will be located at Ottawa, where a bonus of \$75,000 has recently been voted by that city. The company also gets a bonus from the Dominion government of \$3,200 per mile on completed road. Messrs. Balch & Peppard, of Minneapolis, Minn., have contracts for the entire line, except bridges, from Moira, N. Y., to Ottawa, 73 miles. Bridges are being built by the Phoenix Bridge Co., those on the Canadian side being completed. The bridge spanning the St. Lawrence at Cornwall, and the bridges on the New York side are well under way. The grading from Moira to the St. Lawrence is about three-fourths done, and the company expects to have the entire line completed, including the bridges, by July 1. The gap between Tupper Lake, N. Y., and North Creek is not yet under contract. George W. Parker, of Cornwall, Ont., is President. (See this column for Dec. 17.)

**Northern Pacific.**—It is officially stated that this company is completing a partially finished extension to Lewiston, Idaho. The track will be extended from the present terminus, three miles south of Juliaetta, down the valleys of the Potlatch and Clearwater rivers to Lewiston, 20.6. The contract has not yet been awarded, but the time for receiving proposals is closed. There will be a bridge across the Clearwater which will require five fixed Howe truss spans 150 ft. long, and one draw span about 25 ft. in length.

**Ontario & Rainy River.**—The Ontario government has granted this company a subsidy of \$120,000 on its proposed line from Fort Arthur, Ont., west about 245 miles to Fort Frances. The road has been previously subsidized at the rate of 3,000 per mile for 80 miles. (See this column for Sept. 10.)

**Pembroke Southern.**—The Ontario government has granted a subsidy to this company of \$10,500 for building the portion of this line from Pembroke 3.5 miles to Garden Lake. The entire extension proposed is to Golden Lake, a point on the Canadian Atlantic, 21 miles. (See this column for Dec. 17.)

**Pennsylvania.**—It is reported that work has been begun on the improvements on the main line between Altoona, Pa., and Bennington. The intention is to make three tracks complete from Bennington to Kittanning Point, and four tracks from that point to Altoona. The



**Chicago Great Western.**—A meeting of the holders of four per cent. debenture and five per cent. preferred



stock "A" was held Jan. 12, to consider a resolution to increase the four per cent. debenture stock from \$15,000,000 to \$30,000,000, the purpose being to redeem, as opportunity offered, any obligation prior to this stock.

**Chicago, Rock Island & Pacific.**—A special meeting of the stockholders has been called to meet in Chicago, Feb. 15, for the purpose of authorizing the issue of bonds under the refunding plan outlined in this column for Dec. 3.

**Choctaw, Oklahoma & Gulf.**—This company has sold \$200,000 of general mortgage five per cent. bonds to build seven miles of road to extend from Wister, the eastern terminus, east to a point on the Kansas City, Pittsburgh & Gulf, and another extension west 25 miles from Fort Reno, Okla.

**Detroit & Lima Northern.**—This company has filed a mortgage at Bellefontaine, O., for \$1,670,000 to the Manhattan Trust Company of New York, covering all its line. The company has also taken possession of the Dayton Northern, which has terminal facilities at Lima, O.

**Hutchinson & Southern.**—This road was sold at a Receiver's sale at Hutchinson, Kan., Jan. 14, as announced in this column for Dec. 24. It was purchased by the Reorganization Committee at the upset price of \$100,000. The road extends from Hutchinson through Camden to Medford, 117 miles. The Receiver was appointed Aug. 9 1893.

**Illinois Central.**—Messrs. Kuhn Loeb & Co. and Vermilye & Co. are offering \$5,000,000 of the St. Louis Division & Terminal and \$10,000,000 Louisiana & Terminal 3½ per cent. gold bonds at 95 per cent. and interest. This is in pursuance of the plan of refunding recently adopted by the railroad company.

**Lake Shore & Michigan Southern.**—This company has listed \$2,092,000 of 3½ per cent. bonds of 1897 to retire \$2,388,000 of seven per cent. bonds.

**Louisville & Southeastern.**—This company has filed a mortgage of \$2,500,000 five per cent. 30 year gold mortgage bonds. The company is the successor of the Richmond, Nicholasville, Irvine & Beattyville, recently purchased by Adolph Segal, of Philadelphia. It proposes to make an extension of 36 miles from Irvine, Ky., to Beattyville. (See this column for Dec. 31.)

**Louisville, Evansville & St. Louis.**—Messrs. Lloyd & Trabue, of New York, have prepared a plan of reorganization which provides for the issue of \$5,000,000 first mortgage five per cent. 100 year gold bonds, \$4,000,000 three per cent. gold income bonds with funding power, \$5,000,000 preferred stock and \$5,000,000 common stock. Heretofore the various interests have been unable to come to an agreement. (See this column for Dec. 31.)

**National Docks Railway.**—At a meeting held in Jersey City, N. J., Jan. 13, it was decided to consolidate with this company the New Jersey Junction connecting the Kill von Kull and the Bay Creek railroads. These four lines form parts of one line running from the West Shore station at Weehawken south to Bergen Point, and connect with all the railroads and terminals in Jersey City. It is stated that nearly all the stockholders were present and the consolidation was effected by a unanimous vote.

**Oregon Railway & Navigation Co.**—The privilege of converting first mortgage six per cent. bonds into the four per cent. consols, maturing 1946, of the new company, at \$1,210 in four per cent. bonds for \$1,000 in the six per cent. bonds, will be withdrawn on Feb. 1. (See this column for Dec. 17.)

**Port Plain & Richfield Springs.**—The sale of this road, which was advertised to take place at Herkimer, N. Y., Dec. 31, has been indefinitely postponed. (See this column for Dec. 24.)

**South Jersey.**—A plan of reorganization has been issued by the Committee, consisting of Robert P. Linderman and Thomas Robb, which provides for new securities as follows: \$350,000 prior lien five year, five per cent. gold bonds to retire receivership certificates; \$150,000 general mortgage, series "A," 50-year, five per cent. gold bonds to be exchanged at 90 per cent. for an assessment of 12 per cent. on the face value (\$1,035,000) of the claims of the creditors and bondholders; \$600,000 general mortgage, series "B," 50-year, five per cent. gold bonds issued to holders of present indebtedness who assent to the plan to the amount to 50 per cent. of their claim, together with the stock of the new company at par for the full amount of such claims; also, \$600,000 preferred stock and \$600,000 of common stock. No interest is to be paid out of the earnings of the road for the bond issues for the first two years, that interest being provided for in the assessment. No provision is made for the old stock. Assenting security holders must deposit their security with the Girard Life Insurance Annuity & Trust Co., of Philadelphia, by Jan. 28. This line extends from Winslow Junction to Cape May, N. J., 54.1 miles, with a branch from Tuckahoe to Sea Isle, 12.1 miles. A receiver was appointed in August, 1894.

**Western New York & Pennsylvania.**—This company has purchased, at a price said to be close to \$1,000,000, the Buffalo, St. Mary's & Southwestern Railroad, the four collieries of the Shawmut Mining Company and several thousand acres of bituminous coal lands in the state of Pennsylvania. The purchased road extends from Clermont to Hyde, Pa., 45.67 miles, with a branch of 1.92 miles from Shawmut to the mines.

**West Florida, Alabama & Gulf.**—This company has been incorporated in Florida to build a railroad from the Alabama State Line south through Appalachicola, Greenwood, Chiply and St. Andrews Bay. T. Spencer, of Appalachicola, Fla., is one of the Directors.

**Wrightsville & Tennille.**—The earnings for the year ended June 30, according to the annual report, were as follows:

Year:	1897.	1896.	Dec.
Gross earn.....	\$87,166	\$92,233	\$5,067
Oper. expen.....	52,951	57,192	4,241
Net earn.....	\$34,215	\$35,041	\$826

The gross earnings for the six months ended Dec. 31, 1897, were \$49,426, against \$48,194 for 1896, a gain of \$1,232.

**Wisconsin Central.**—Francis R. Hart, Alpheus H. Hardy and I. W. Chick, all of Boston, have been appointed a committee for the protection of the income five per cent. bonds and the preferred and common stock. Holders of these securities are requested to deposit them with the Old Colony Trust Company, of Boston, or the Manhattan Trust Company, of New York, prior to Feb. 5. (See this column for Jan. 14.)

Judge Lacombe, at Brooklyn, on Jan. 17, signed an auxiliary decree of foreclosure in the suit of John A.

Stewart and Edwin H. Abbott, as Trustees, for \$12,000,000. This is supplemental to the decree of Judge Jenkins of the United States Circuit Court of Milwaukee, Wis., referred to last week.

**Zanesville Terminal.**—Judge Crew, at McConnellsville, O., Jan. 11, appointed Chase Andrews Receiver of this company. This road extends from Muskingum, O., to West Zanesville, 4.62 miles, and is leased to the Columbus, Sandusky & Hocking, that company guaranteeing interest on the bonds, which are \$453,000 first mortgage five per cent. 50-year gold coupon bonds, due July 1, 1940. There is an equal amount of capital stock outstanding.

#### Electric Railroad News.

**Brooklyn, N. Y.**—Judge Maddox, of the Supreme Court in Brooklyn, appointed as Receivers of the Brooklyn & Brighton Beach Railroad Co., E. L. Langford, President of the road, and ex-Controller George W. Palmer.

**Chicago, Ill.**—At the annual meeting of the Chicago City Railway Co. new officers and Directors were elected as follows: President, Menard K. Bowen; First Vice-President, William B. Walker; Second Vice-President, Joseph Leiter. Directors, Samuel W. Allerton, M. K. Bowen, D. G. Hamilton, Joseph Leiter, George T. Smith, William B. Walker, George H. Wheeler. The road carried in 1897 95,621,112 paying passengers, while its cars ran 24,378,000 cars-miles. The net earnings on the stock of \$12,000,000 amounted to 13.74 per cent. (\$75,876) as against 13.42 per cent. 1896. It cost the company in 1897 60.84 per cent. of its total receipts to operate the system, against 62.52 per cent. in 1896.

**Clearwater, Fla.**—H. B. Plant, President of the Plant System, writes us that there is no foundation for the rumor that he is interested in the contemplated electric railroad in Clearwater.

**New York.**—The Third Avenue Railroad Co. has practically completed arrangements whereby the control of the Union Railway Co. will pass to the Third Avenue Co. The Union Railway Co. consists of a network of trolley lines principally in the borough of the Bronx. Edward Lauterbach, Counsel for the Third Avenue Railroad Co., says "Negotiations for the acquisition of the Union Railway Co.'s system have substantially been accomplished. The lines extend through 36 miles of streets, and the company has the right to build on 54 miles more of streets. The Third Avenue Co. has an option on more than a majority of the \$2,000,000 of Union Railway Co. stock."

**Shamokin, Pa.**—At a meeting of the directors of the Shamokin Street Railway Co., held recently, it was decided to suspend the operation of the cars for an indefinite period. The road has been a money losing venture from the start.

**Toledo, O.**—At the annual meeting of the Toledo, Bowling Green & Fremont Railway Co. it was decided to reduce the number of Directors from 15 to 7. The Directors elected were: M. I. Wilcox, James A. Huston, Edwin Jacoby, Frank J. Hoag and William B. Taylor, of Toledo, and Mr. E. K. Mussey, of Elyria.

**Youngstown, O.**—The Mahoning Valley & South-eastern Railway Co. (see *Railroad Gazette*, Nov. 12, 1897) has been organized to build an electric railroad. John E. McVey, President; L. W. King, Vice-President; C. Y. McVey, Secretary; A. A. Anderson, Treasurer and General Manager.

#### TRAFFIC.

##### Traffic Notes.

It is announced that from April 1 next the Pullman sleeping cars on the New York, Ontario & Western will be taken off, and Wagner cars put in their place.

The Terre Haute (Ind.) Weighing and Inspection Bureau saved for the railroads in the month of December the sum of \$7,643. Over \$6,500 was saved by reweighing carload freight.

The Illinois Central and the Southern Pacific have contracted to carry from Jeffersonville, Ind., to San Francisco material for four steamboats. It will fill about 50 cars and about 60 workmen will go from Jeffersonville to put the boats together.

##### North Shore Despatch.

This is the name of a new fast freight line to be established Feb. 1. It will do business over the West Shore, the Fall Brook, the Philadelphia & Reading, the Michigan Central, the Cincinnati, Hamilton & Dayton, the Toledo, St. Louis & Kansas City, the Flint & Pere Marquette, and the Indiana, Illinois & Iowa.

The headquarters will be at Detroit, and the General Manager is Mr. W. J. Mann. Mr. Mann began service in the traffic department on the Michigan Central in 1877, and has been with the Blue Line since 1884.

##### New York Grain Exports.

The exports of grain from New York in the calendar year 1897 are reported in the *Journal of Commerce* as aggregating 115,575,644 bu., which is far beyond the record for any other year except 1880. In that phenomenal year (before Western grain was exported through Newport News, Norfolk and the Gulf ports), the total exports from New York were 113,343,163 bu. Exports for the last seven years, beginning with 1891, were, in even millions, 68, 74, 56, 33, 42, 69 and 115½. These statistics are given on the authority of Mr. William Ferguson, who has collected statistics at New York for the last 20 years and whose business is that of preparing vessels to load grain and to advise shippers how much grain a vessel has previously carried. While his figures include only grain going to British and European ports, his statement of wheat exceeds by more than eight million bushels that of the government bureau of statistics, which is explained by the fact that grain in bond from Canada is included. In Mr. Ferguson's tables steam and sailing vessels are separated. In 1880 the number of bushels carried in steam vessels was 50 millions, and in sailing 63; the next year 53 and 19, respectively; and since then sailing vessels have gradually dropped out until, in the year just closed, only one million out of 115 million went in sailing vessels. British ships carried nearly three-fourths of the total shipments of 1897. In 1885 the average grain cargo was 42,782 bu.; in 1897 it was 90,364. The vessels did not, of course, all carry full cargoes of grain. In 1897 the quantity of oats, 34,409,704 bu., was an unusually large proportion of the total. The quantity of wheat was 33,624,000 and of corn 30,822,268 bu.

##### Approval of Differentials.

The Inter State Commerce Commission, in an opinion by Commissioner Prouty, has announced its decision in the case of the Savannah Bureau of Freight and Transportation against the Charleston & Savannah Railway.

The case involves the reasonableness of rates on fertilizer from Savannah to points in Georgia, Alabama and Florida, and the lawful relation of such rates to charges from Charleston and other points to like destination. The Commission decides:

1. That defendants' present differential of 50 cents more per ton from Charleston than from Savannah to points in Georgia other than common points is not unreasonable or prejudicial to Savannah.

2. That charging the same rate from Savannah and Charleston over the defendant all-rail lines to points in Florida in competition with ocean and rail competition from Savannah and Charleston is not unlawful.

3. That a lower differential as between Savannah and Charleston on fertilizer to points in Alabama reached by the Alabama Midland than the differential established as between those cities on fertilizer to points in Georgia does not appear justified, and that sufficient difference is not made in rates to some stations in Florida; and defendants are advised to adjust such rates in accordance with suggestions stated, with leave to complainants to apply for an order if such adjustment is not made.

Higher rates charged by defendants on fertilizer from Charleston or Savannah to intermediate points between those cities than they charge over the entire distance between Charleston and Savannah are justified by the existence of water competition.

The circumstances and conditions governing the transportation of fertilizer from Charleston to Valdosta and various other stations are rendered substantially dissimilar from those applying in the transportation of fertilizer from Charleston over the same line to shorter-distance localities by railroad competition at Valdosta and said other stations, which controls and affects the rate, and higher charges on fertilizer to such shorter-distance points are not in violation of the fourth section as interpreted by the United States Supreme Court in *Interstate Commerce Commission v. Alabama Midland*.

##### Chicago Traffic Matters.

CHICAGO, Jan. 19, 1898.  
Another war over flour rates is imminent, the 4 cent cut made in the rate from the Northwest to the seaboard by the St. Paul company having stirred up all its competitors. Important changes in the same rates have also been announced to take effect Feb. 1 to points in Indiana, Michigan and Ohio.

Alleged secret rate cutting by the Kansas City, Pittsburgh & Gulf is worrying the other Western lines. That road is said to be making a rate on corn of 12 cents from Kansas City to Galveston and New Orleans, and in addition absorbing the switching charge of 2 cents. This is the lowest rate ever made from the Missouri River to tidewater on corn.

The grain rates to the Atlantic seaboard, 17½ cents on corn and 20 cents on other grain, announced last week, do not go into effect until Jan. 25. The circular issued Jan. 12 made no changes in previously existing conditions, except to postpone the date of this reduction from Jan. 1 to Jan. 25. The very heavy shipments of grain now going forward appear to be wholly on contracts made before Jan. 1, and it is said that large quantities of wheat are being carried to New York at 6 cents a bushel or 10 cents per 100 lbs. Two of the leading roads are said to have contracted for a million bushels from one shipper at this rate.

The total receipts of live stock at Chicago during the calendar year 1897 were 279,662 cars, an increase of 2,225 cars over 1896. The shipments of live stock were 70,739 cars, a decrease of 3,316 from the previous year. The receipts by the St. Paul and the Northwestern roads were in each case about 3,000 cars more in 1897 than in 1896, the other principal roads showing slight changes. The shipments fell off seriously on all the principal roads to the East except the Lake Shore, the Michigan Central and the Fort Wayne. The Fort Wayne showed a slight decrease, the Michigan Central a considerable increase and the Lake Shore an increase from 9,163 cars to 19,475. It will be remembered that the Lake Shore has made very fast time with live stock trains during the past year.

The receipts of grain at Chicago in the month of December amounted to 27,373,809 bu. as compared with 17,515,104 bu. in the same month of 1896.

The Central Freight Association has compiled the following statement of the shipments of flour, grain and provisions eastward from Chicago during the year 1897:

Roads.	Flour. Tons.	Grain. Tons.	Provisions. Tons.	Total. Tons.	P. c.
B. & O.....	36,286	59,161	46,464	141,911	5.3
C. C. & St. L.....	71,555	99,361	16,347	187,263	7.1
C. & E.....	29,771	143,465	89,531	262,767	9.9
G. T.....	8,253	150,193	63,895	222,326	8.4
L. S. & M. S.....	21,517	219,564	44,024	285,105	10.7
Mich. Cent.....	22,553	300,742	66,289	389,575	14.7
N. Y. C. & St. L.....	35,196	148,935	104,121	288,252	10.9
P. C. C. & St. L.....	22,606	117,124	116,712	256,442	9.7
P. F. W. & C.....	85,364	226,010	62,401	373,775	14.1
Wabash.....	5,835	193,853	43,800	243,488	9.2
Total.....	358,921	1,638,408	653,575	2,650,904	100.0

The totals the year previous were: Flour, 354,630 tons; grain, 1,863,443 tons; provisions, 570,650 tons. This makes a decrease in 1897 of 15,709 tons of flour and 205,035 tons of grain, and an increase of 82,925 tons of provisions. The decrease is due to the very low rates for grain by lake during the past season. The railroads which carried more in 1897 than in 1896 were the Michigan Central, the New York, Chicago & St. Louis, the Pittsburgh, Cincinnati, Chicago & St. Louis, and the Pittsburgh, Fort Wayne & Chicago. The road suffering the greatest loss was the Baltimore & Ohio.

Eastbound shipments from Chicago and Chicago junctions to points at and beyond the western terminus of the trunk lines for the week ending Jan. 13 amounted to 118,067 tons, as compared with 121,757 tons the preceding week. This statement includes 65,645 tons of grain, 15,059 tons of flour and 12,193 tons of provisions, but not livestock. The following is the statement in detail for the two weeks:

Roads.	WEEK ENDING Jan. 13.		WEEK ENDING JAN. 6.	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio.....	10,878	9.2	6,947	5.7
C. C. & St. Louis.....	4,926	4.2	5,101	4.2
Erie.....	11,323	9.6	11,389	9.4
Grand Trunk.....	16,376	13.9	13,826	11.4
L. S. & M. S.....	13,776	10.8	18,015	14.8
Michigan Central.....	9,922	8.4	10,347	8.5
N. Y. C. & St. L.....	8,951	7.6	13,204	10.8
Pitts. Cin. Chi. & St. Louis.....	11,544	9.8	15,236	12.5
Pitts., Ft. Wayne & Chicago.....	23,682	20.0	20,761	17.0
Wabash.....	7,689	6.5	6,911	5.7
Totals.....	118,067	100.0	121,757	100.0